THE Vedic People

Their History and Geography

Rajesh Kochhar

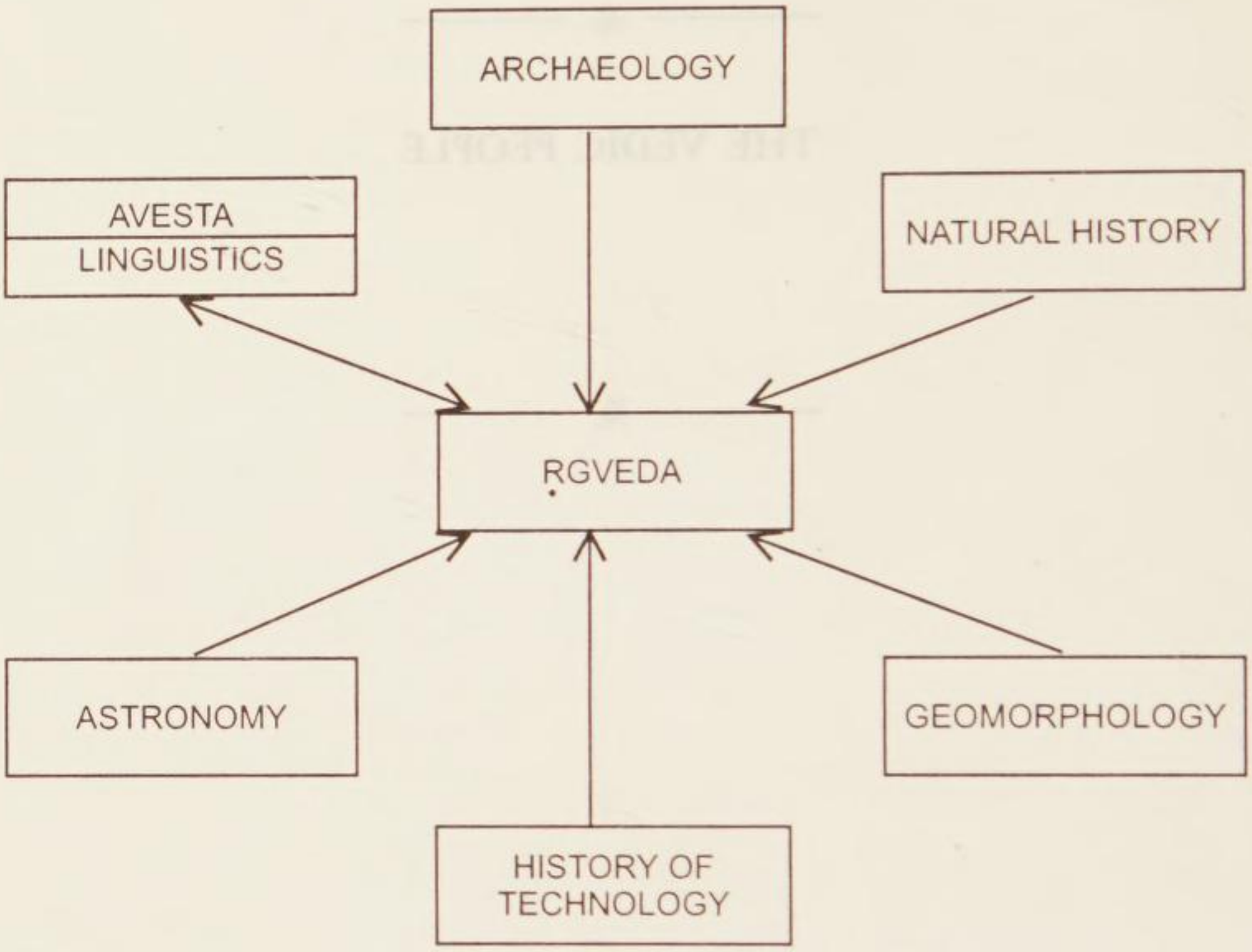
SHOUT
SHARE
IT

- ⁕ Was the Ṛgveda composed in Afghanistan?
- ⁕ Was the Ghaggar River once the mighty Sarasvatī of the Ṛgveda?
- ⁕ Were the Ṛgvedic people and the Harappans the same?
- ⁕ Was Rāma's Ayodhyā in India?

In *The Vedic People*, well-known astrophysicist Rajesh Kochhar provides answers to these quintessential questions of ancient Indian history. Drawing upon and synthesizing data from a wide variety of fields—linguistics and literature, natural history, archaeology, history of technology, geomorphology and astronomy—Kochhar presents a bold hypothesis which seeks to resolve several paradoxes that have plagued the professional historian and archaeologist alike. Arguing that a major part of the Ṛgveda was composed in south Afghanistan (after c. 1700 BC) before the Ṛgvedic people entered the Punjab plain and well before they moved east of the Ganga River, the author asserts that during their migrations the Indo-Aryans not only carried with them their rituals and hymns but also place and river names which they selectively reused.

Written in an extremely lucid style, by a professional scientist who argues his case logically at every step, this book will be eagerly read by general readers and professional historians, archaeologists, and Indologists alike.

THE VEDIC PEOPLE



We dance round in a ring and suppose
But the Secret sits in the middle and knows

Robert Frost

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RAJESH KOCHHAR

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For

My father Trilok Nath Kochhar
and daughter Garima Kochhar

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SANSKRIT ALPHABET IN TRANSLITERATION

a ā i ī u ū ṛ e ai o au
k kh g gh ṅ
c ch j jh ñ
ṭ ṭh ḍ ḍh ṇ
t th d dh n
p ph b bh m
y r l v ś ṣ s h ḷ ṃ

(Note that c is pronounced as ch in church, and ch as chh in Chattisgarh. Both ś and ṣ can be approximated by the English sh.)

PREFACE

Where was the Ṛgveda composed and when? What is the relationship between the Ṛgvedic people and the Harappans? Are they the same people or are they different? If different, did the Ṛgvedic people destroy the Harappan civilization or did they step in later to fill a political vacuum? Is the Purāṇic history pure mythology or can some sense be made of it? When was the Mahābhārata battle fought? How is it that the archaeological sites like Hastinapur and Ahichchhatra, cognate with the Mahābhārata-named Hastināpura and Ahicchatra, are older, and not younger, than sites such as Ayodhya and Sringaverapura, cognate with the Rāmāyaṇa-named Ayodhyā and Sṛṅgaverapura? (Note that a distinction has advisedly been made between the literary and modern-day spellings of place-names. Subsequently, this distinction in spellings has been retained for other names, including those of rivers.)

These questions epitomize ancient Indian history. Ancient India has not left behind any recorded history on papyrus, cuneiform tablets or oracle bones. Even the benefit of decipherment of the Harappan script is not yet available.

The Ṛgveda is tersely composed in a language that has been obscure for at least 2,500 years. Historical and geographical references in it are few and incidental. Seen in isolation, the Ṛgvedic verses can be interpreted in a wide variety of ways. In the absence of any obvious correspondence between the archaeological finds and the linguistic evidence, the only way to learn about India's ancient past is to examine all possible evidence that has a bearing on the subject and try to synthesize it into a single self-consistent theory.

This book seeks to interpret the historical and geographical content of the Vedas, Purāṇas, Rāmāyaṇa, Mahābhārata and

Avesta in a global context with the help of data from such diverse disciplines as archaeology, natural history, metallurgy, astronomy, geology and even genetics. In particular, this book examines afresh the question of the identity of the Ṛgvedic river Sarasvatī, and argues that much of the received wisdom on the subject cannot stand up to close scientific scrutiny. The book points out that Purāṇic history is not bunk; it is the geography that is misplaced. The book suggests some specific archaeological diggings which need to be taken up in Afghanistan and elsewhere to provide supporting evidence. Such a project can be overseen by UNESCO.

In earlier times, prejudice and bias largely remained localized while wisdom diffused slowly. But now, thanks to modern developments in transport and telecommunications, it has become possible to disseminate information (including disinformation) over truly vast geographical areas in graphic detail, at breakneck speed and with frightening intensity. If we are going to use the fruits of science in propagating our views, it is only reasonable to insist that scientific data and methodology be used in formulating these views in the first place.

Reconstruction of the past is an important part of the exercise of nation building. A nation's heritage should be based on hard, scientifically tested facts and not on vague notions born out of cultivated ignorance. History is not the mythology of the dead. A nation should be able to look at its past straight in the eye. Only then can it cope with the present and plan for the future.

This book has grown out of the text of the Kosambi Memorial Lecture I delivered in Delhi on 16 October 1992. I thank the Kosambi Research Institute for Scientific Investigations into Society and Arvind N. Das for inviting me to deliver the lecture and for suggesting that I write it down in an expanded form.

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1

ARROW OF TIME

Time goes, you say? Ah no!
Alas, Time stays, we go.

—Henry Austin Dobson,
'The Paradox of Time'

Of all the laws of nature, of all the facts of life, the most significant and the most complex is the arrow of time, the non-stop, one-way flow of time.[1] All living beings exist in time and are changed by it. But only human beings have the ability to manipulate time. They can remember the past and plan for the future. They can thus use both memory and foresight as guides to their present actions. They are acutely aware of the severe mismatch between their physical attributes and mental prowess. Their life span is very short and they are physically vulnerable. But their intellect is sharp and their ambitions high. Human beings want to control events, territory and their fellow humans. They, therefore, turn to the past as a source of wisdom, as a source of strength and, most importantly, as a source of legitimacy.

In very ancient times, the rulers acquired legitimacy for themselves through a pretended divine connection. They, for example, claimed descent from the sun, moon or Jupiter. The very first task assigned to astronomers in the past was to establish divine sanction for the rulers. In later times when the society's awe of the skies weakened, legitimacy had to be obtained through the past—for example, by highlighting the feats of ancestors or through spurious genealogies.

Different people may be interested in the past[2] for different reasons. There are, however, certain intrinsic difficulties associated with examining the past. First, the past does not have an independent existence. Even though the past precedes the present, it can exist only in the context of the present. The only look permitted at the past is a flashback. When we examine the past

events we already know what happened subsequently. The question "what happened?" is a neutral question because it asks for factual information. But it cannot be decoupled from "what it led to?", which is a loaded question because it calls for a subjective assessment. It is, therefore, not possible to discuss the past in a totally detached manner.

There is yet another complication. If the past is to be comprehended, it must be condensed. There is, however, no objective criterion that can be used to define historical grain vis-à-vis historical chaff and separate the two. In other words, history cannot be written without implicating the historian. That is why there is a professional hazard associated with history. The past should be evaluated in the framework of the past, and the present in the framework of the present. One should then study how this framework has evolved with time. Unfortunately, it is very easy to confuse the two frameworks and get caught in a time warp. A person can get so overwhelmed by the past norms and practices that he may like to model the present as a replay of the past. At the other end of the spectrum, a person may be so enamoured of the present enlightenment that she may like to backdate it. Both the approaches are defective because they do violence to the concept of flow of time. Time is a one-way street. We are permitted to turn our neck and look back, but we are not permitted a U-turn.

Our interpretation of the past depends upon our perception of the present. That is why history cannot provide proof; it can only provide illustration. This, however, does not mean that history is a free-for-all, and can never be definitive. Uncertainty in history lies at the level of the significance of events, not at the level of events themselves. If there are only two points marked on a graph paper, any number of curves can be made to pass through them. But if the number of points is large, then the connecting curve suggests itself. The only way to reconstruct the past is to first collect information on all possible aspects and then produce a synthesis. When two historians disagree they should not be telling each other: "These are my facts and those are your facts. Let us use them as brickbats." Instead they should be saying: "These are the facts, not your facts or my facts, but the facts. And this is my interpretation, and that is yours."

All available facts do not carry equal weight. Some are so firmly established that the conclusions based on them can be considered more or less binding. Other facts may be suggestive rather than conclusive. In such cases, the inadequacy of the data should manifest itself as uncertainty in the conclusions based on them. All research is open-ended. At any given time there are questions which cannot be answered with certainty. To answer them, new data are needed. The new data answer old questions but in turn raise new questions which, however, are more intricate than the earlier ones. In this manner the frontier of ignorance is pushed to more and more subtle levels.

2

THE PROBLEM

A man is wise with the wisdom of his time only, and ignorant with its ignorance.

—Henry David Thoreau

Information on ancient India comes from two distinct traditions, archaeological and literary. At the current level of knowledge the two traditions are by and large mutually exclusive. The archaeological evidence as represented by the Harappan tradition remains unsupported by any written account. On its part, the literary tradition as represented by the Vedic texts remains uncorroborated by any firm archaeological evidence.

The Vedic corpus consists of the Ṛgveda and the associated texts. Traditionally, it was forbidden to write these texts. They were most meticulously memorized by select priestly families who transmitted them orally from generation to generation. The Purāṇas stand in contrast to the Vedic texts. Though originally meant to contain, among other things, independent records of royal dynasties, they are a classic example of how history should not be recorded. They were often recast to cater to the prevailing needs of the narrators and the listeners, with the result that their credibility now is extremely low. We can compare the Vedic literature to an old gramophone record which has faithfully preserved the original recording. The Purāṇas are then like an audio cassette which has been dubbed and redubbed so many times that it is not an easy task to separate the original "signal" from the accumulated "noise".

It was in the wake of the European arrival in India that the Vedic texts were examined as documents of human history. As in many other fields, the earliest Europeans to take an interest in Sanskrit and its antecedent—the much older Ṛgvedic language (chapter 3)—were the Christian missionaries, who were mostly based in the coastal areas of South India.

Europe learnt about the existence of Sanskrit from the correspondence of the first Jesuit in India, St Francis Xavier (1506–52), who arrived in Goa in 1542. In a letter written in 1544 describing Sanskrit as equivalent to Latin, he quoted the Sanskrit invocation *Om Srii naraina nama* and translated it into Latin. This was the first Sanskrit text known to Europe.[1] It did not take long for Jesuits, trained as they were in European classical languages, to discover their kinship with Sanskrit. Fr Thomas Stephens, author of the first Konkani grammar as well as of *Christ Purāṇa*, and incidentally the first Englishman in India, wrote to his father in 1583 that the structure of many "languages of these places" was allied to Greek and Latin. In 1585 Fillipo Sasseti (an Italian merchant in Goa) in letters to Europe described how "our language of today has a lot in common" with "Sanscruta".[2]

Fr Roberto de Nobili (1577–1655), the Brahmanized Jesuit from Italy who came to Madurai in 1606, is acknowledged as "the first European Sanskrit scholar, a man who could quote from Manu, from the Purāṇas, and even from works such as the Āpastambasūtra."[3] "Not only was the Smṛti literature known to him but also the Veda, at least one of its Śākhās: the Yajurveda of the Taittirīyas".[4]

In 1651, Abraham Roger's translation of some of the proverbs of poet Bhartṛhari (fifth–sixth century AD) into Dutch provided Europe with its first glimpse of a Sanskrit work.[5] Roger was a chaplain at the Dutch settlement of Pulicat in South India from 1631 to 1641. The first European Sanskrit grammar, in Latin, was written in 1660 by the German Jesuit Fr Heinrich Roth[6] (1620–68) at Agra, who also was the first one to introduce the Devanagari script to Europe. A Sanskrit grammar composed in 1734 by the astronomer, geographer and Sanskrit scholar Fr Francis J. Pons (1698–1752), of the French Carnatic Mission, arrived in France in 1744 but was ignored by the gentlemen of the Paris Academy.[7] Fr John (or Jan) Ernst Hanxleden (1689–1732), working on the Malabar coast, wrote a Sanskrit grammar in Latin and also prepared a Sanskrit-Portuguese dictionary. His work, however, did not become known in Europe until 1790 when the Carmelite scholar Paulinus of St Bartholomew published it in Rome with a commentary.[8]

In 1767 Fr Gaston Coeurdoux (1691–1777), a French Jesuit based in Pondicherry, pointed out the extraordinary similarity in

vocabulary and grammar between Latin and Greek, on the one hand, and Sanskrit, on the other. He also suggested that this commonality was due to a common origin. Coeurdoux's memoir was read before the French Academy in 1768 but was published only in 1808. His manuscripts and publications were used by others without acknowledgement. It has been suggested that the well-known *Hindu Manners, Customs and Ceremonies* by Abbe Jean A. Dubois (1765–1848) is actually the work of Fr Couerdoux.[9]

Fr Jean Calmette (1693–1739), working in Andhra Pradesh, was an intrepid collector of Sanskrit works. He was the first European scholar to get possession of all the four Vedas.[10] During this period, there was such a craze for collecting literary works that the demand was met by a large supply of forged Vedas and upavedas, the chief centres of forgery being Masulipatam on the Andhra coast and Nadia in Bengal.[11]

The first scriptures to be seriously noticed in Europe were the Parsi rather than the Hindu. Europe was already aware of Zarathushtra known to the Greeks as Zoroaster and had an intellectual interest in his teachings. With a view to obtaining first-hand information about the Parsis, Anquetil Du Perron (1732–1805), a 20-year-old energetic French oriental scholar, enrolled himself as a soldier in the French East India Company and left for India in 1755. He returned nine years later, "winning from the Parsis both their books and their knowledge". In 1771, he published the French translation of the Avesta.[12]

Du Perron has yet another first to his credit. During 1656–57, a total of 51 Upaniṣads were translated from Sanskrit into Persian, under the title *Sirr-e-Akbar* by Dara Shikoh, the luckless eldest son of Emperor Shah Jahan and a Sanskrit scholar himself. In this task, Dara Shikoh was assisted by many pandits brought from Benaras to Delhi for the purpose. His translation retained many Sanskrit words, which were explained in a glossary. In 1775 the French resident in Bengal sent a copy of this translation to Du Perron in Paris. Du Perron obtained another copy, collated the two and got down to translating it into French and Latin. The translation of four of the Upaniṣads was published in 1786. The full translation into Latin was published in two volumes in 1801 and 1802 under the title *Oupnek'hat*. It was the first Hindu scripture published in translation in Europe. On all counts it was a

formidable work. The translation was verbatim, the grammar Latin, the syntax Persian, and the vocabulary largely Sanskrit. No wonder then, it went over the heads of most readers. The only person who seems to have read it with profit was the German philosopher Arthur Schopenhauer (1788–1860).[13]

The first British officer to acquire a thorough knowledge of Sanskrit was Charles Wilkins (1749–1836) who came to Calcutta in 1770 in the service of the (British) East India Company. He published a Sanskrit grammar in 1779, an English translation of the Bhagavadgītā in 1785, of Hitopadeśa in 1787, and of the Śakuntalā episode from the Mahābhārata in 1795.[14] The early Jesuit, French and British efforts were sporadic, desultory and mostly out of personal curiosity. What gave a direction to these studies was the administrative and political needs of the East India Company.

In 1765 the nominal Mughal emperor, Shah Alam, appointed the Company the Diwan of the Bengal subah (province), which consisted of Bengal, Bihar and coastal Orissa. As Diwan, the Company became responsible for the collection of land revenue and administration of civil justice. In 1772, Governor Warren Hastings (who often quoted from the Gītā in letters to his wife),[15] introduced a system of judicial administration which necessitated the codification of the Hindu and Muslim personal laws. To prepare the Hindu code, 11 most learned and eminent pandits from different parts of Bengal were assembled at Calcutta. Working from 1773 to 1775, they culled from the ancient texts a Sanskrit digest under the title *Vivādārṇavasetu* (a bridge across the ocean of disputes). There was however nobody who could translate it directly into English. Accordingly, it was first translated into Persian—the official language of the Mughal administration—with which the English were already familiar. From the Persian version, the English translation was carried out by the Calcutta-based, Oxford-educated Nathaniel Brassey Halhed (1751–1830) and published in 1776 in London as *A Code of Gentoo Laws*, subtitled *Ordinations of the Pundits*.[16] In 1787, Halhed also independently translated *Sirr-e-Akbar* from Persian into English, but the translation remained unpublished.[17]

The codification brought home the point that though Sanskrit was defunct it was not dead. In the meantime, in 1773, the

British Parliament officially took note of the Company's territorial possessions in India and sought to regulate their administration. A judicial system headed by a Supreme Court was set up. In September 1783, there arrived in Calcutta a new Supreme Court judge (Sir) William Jones (1746–94), an established oriental scholar[18] and unsuccessful candidate for Arabic professorship at Oxford University. Jones already knew Hebrew, Arabic and Persian; on arrival, he rapidly learnt Sanskrit. In 1784, the Asiatic Society was formed at Calcutta on Jones's initiative and with him as the president, under Hastings's patronage. It was under the auspices of the Society that Indology was formalized as an academic discipline and its study institutionalized.

In 1789, Jones published a translation of Kālidāsa's play *Śakuntalā* which went into five English editions in less than 20 years and was in turn translated into German. To Jones also belongs the credit for the first printing of a Sanskrit text. This was a short lyrical poem *Ṛtusaṃhāra*, or "the cycle of seasons", published in 1792. In 1799 Jones published his English translation of Īśa Upaniṣad.[19] It was Jones's successor Henry Thomas Colebrook (1765–1837) who, as president of the Asiatic Society, made the West aware of "the existence and nature of the Rigveda"in 1805.[20]

The Asiatic Society had a tremendous impact on European scholarship as can be gauged by the reception accorded to its journal *Asiatick Researches*, first published in 1788. It was pirated in London and translated in Paris.[21] The Society's early members initiated Indological studies in Europe. A founding member of the Society, Alexander Hamilton (1765–1824), became the first person to teach Sanskrit in Europe. Hamilton was passing through France on his way back to England when in 1802 fresh hostilities broke out and Hamilton was taken a prisoner. During his long forced stay in France as a hostage, he taught Sanskrit at the French Government's Ecole des Language Orientales Vivantes. The first German Sanskritist, Friedrich von Schlegel (1772–1829), was Hamilton's student. Schlegel coined the term comparative grammar. His brother August Wilhelm von Schlegel (1767–1845) translated the Bhagavadgītā into Latin in 1823. He was the first professor of Sanskrit in Germany.[22]

Another important member of the Society, Horace Hayman Wilson (1786–1860), occupied in 1833 the first professorship of

Sanskrit at Oxford named after Lt. Col. Joseph Boden (d. 1811) who had served in the Bombay army. Interestingly, Boden's explicit object was to promote the translation of the Christian scriptures into Sanskrit, so as "to enable his countrymen to proceed in the conversion of the natives of India to the Christian Religion". Proposing himself for the professorship, Wilson laid stress on what he had done for "the rendering of Scripture Terms into the Sanskrit language".[23]

Indology was too important a matter to be left to the Indologists. Because of India's large population and advanced civilization it was essential for the British rulers to establish a rapport with the natives. The establishment of the notion of a common Indo-European[24] heritage, at the very beginning of their rule in India, provided the British with a powerful vehicle to reach out to the upper-class Hindus. In 1792, the British resident at Benaras, Jonathan Duncan, recommended the "Institution of a Hindoo College or Academy for the preservation and cultivation of the Laws, Literature and Religion of that nation at this centre of their faith, and the common resort of all their tribes." Pointing out that "no public Institution of this kind here proposed ever appears to have existed", Duncan argued that "by our exceeding in our attention towards them and their systems the care shewn even by their own native princes", great advantage would accrue "to the British name and nation in its tendency towards endearing our Government to the native Hindoos."[25]

Orientalism,[26] which became confrontationist in the Islamic world, was persuasive and seductive in India. It took the form of Indo-Europeanism. It is thus not surprising that Friedrich Max Müller's (1823–1900) researches at Oxford were funded by the East India Company.[27] Official support for Indology was good value for money. It made the colonial rule palatable to the native leadership. Max Müller, recalling (Rajah) Rammohun Roy's (1772–1833) visit to England that had taken place 50 years previously, wrote: "for the sake of comparing notes, so to say, with his Aryan brothers, Rammohun Roy was the first who came from East to West ... making us feel once more that ancient brotherhood which unites the whole Aryan race, inspiring us ... and invigorating us for acts of nobler daring in the conquest of truth than any that are inscribed in the chronicles of our divided past".[28]

The charismatic Brahmo Samaj leader Keshub Chunder Sen (1838–84), who had met Max Müller in England in 1870, declared at a public lecture in Calcutta in 1877, "Gentlemen, in the advent of the English nation in India we see a reunion of parted cousins, the descendents of two different families of the ancient Aryan race."[29] From about 1850 (since its popularization by Max Müller) the term Aryan was used to denote the "race" of Indo-European speakers—until the Nazi holocaust brought the whole concept of an Aryan race into disrepute.[30]

The nineteenth century saw a flurry of dedicated scholarly activity on the Indological front. It was, relatively, an easy matter to ascertain the external affairs of the Vedic people. The closeness in grammar, vocabulary and phonetics between Sanskrit and major European languages (with the exception of Hungarian, Finnish, Estonian and Basque) suggested that the ancestors of their speakers must have lived together in the remote past. This joint Indo-European homeland was correctly placed after a number of false starts in the Eurasian steppes (chapter 8). Even more remarkable was the degree of closeness between the Ṛgveda and the Avesta, not only in language but also in mythology and religious concepts (chapter 3).

While the external linkages of the Vedic texts are fairly evident, it is far more difficult to interpret them on the basis of their own contents. The texts do not provide any historical dates. An attempt was made by Max Müller to establish a Vedic chronology. His reasoning is given below.

An examination of the language permits the arrangement of the Vedic texts in order of decreasing antiquity: Saṃhitās, Brāhmaṇas, Āraṇyakas, Upaniṣads, and Kalpasūtras. Of all the Vedic texts, the Ṛgveda is the oldest. Its language is the most archaic. All other texts presuppose its existence, while the Ṛgveda does not refer to any other text. It is also obvious that the Āraṇyakas and the Upaniṣads predate the rise of Buddhism. To convert these qualitative statements into numbers, a rule of thumb was applied. The Brāhmaṇas and Āraṇyakas were assigned the time bracket 800–600 BC. The Kalpasūtras, which are younger, were placed at 600–200 BC. Working backwards from the Brāhmaṇas, Max Müller assumed that the Saṃhitās were compiled during 1000–800 BC. Finally, an arbitrary period of 200 years was allotted for

the composition of the Ṛgvedic hymns, and 1200 BC was given as the date for the beginning of the Ṛgveda.[31]

It is obvious that Max Müller's analysis lacks rigour. He himself was aware of it as can be seen from his 1889 Gifford lecture on *Physical Religion*, where he declared: "Whether the Vedic hymns were composed in 1000, 2000 or 3000 BC no power on earth will ever determine".[32] Max Müller's circumspection was not shared by his successors. Barely 20 years later, Arthur Anthony Macdonell placed the Aryan entry into India at about 1500 BC but insisted rather dogmatically that the oldest hymns of Ṛgveda could not be much older than 1200 BC. Macdonell's logic was rather convoluted but his conclusions have acquired the status of an established truth with the passage of time. Starting with 1000 BC as the date of closure of the Ṛgveda, he allotted 200 years for the composition of the hymns on the rather weak ground that this period was sufficient "to account for a development of language and thought hardly greater than between the Homeric [eighth century BC] and the Attic [sixth century BC] age of Greece".[33]

The next step was to account for the fact that the Ṛgveda makes no mention of the original homeland and the actual process of migration. The Ṛgvedic people, on arrival in India, were allotted a period of 300 years to wipe out old memories and start working on the Ṛgveda. Such a great reliance on the silence of the Ṛgveda is curious because as Macdonell himself pointed out elsewhere, "A good illustration of the dangers of the *argumentum ex silentio* is furnished by the fact that salt, the most necessary of minerals, is never once mentioned in the Ṛgveda. And yet the Northern Punjab is the very part of India where it most abounds. It occurs in the salt range between the Indus and the Jhelum."[34] One may add that a reader depending entirely on internal evidence in the Ṛgveda would not learn about the existence of the related text of the Avesta. It would thus seem that it was not the intention of the Ṛgvedic authors to prepare a gazetteer of their life and times.

It was erroneously believed at that time that a historical date could be assigned to Zarathushtra. In 311 BC, Alexander's general, Seleucus, managed to establish his rule over all of Iran. During the Seleucid era, the Zoroastrian priests of Pars, or Persia

proper, sought to establish a "historical" date for their prophet. From the Babylonian records they appear to have learnt that a great event in Persian history had taken place 228 years before 311 BC. This event was the conquest of Babylon by Cyrus in 539 BC. The Persian priests, however, apparently wrongly interpreted this momentous happening as being Zarathushtra's own revelation. Since Zarathushtra was held to have received his revelation in his 30th year, it was concluded that he was born in 569 BC.[35] With this pseudo-historical date assigned to Zarathushtra, the Ṛgveda also got pegged down to a lower chronology. (Current scholarship[36] is inclined to place him at c. 1200–1100 BC, although the actual date could be still earlier by a few centuries.)

The inherent limitations of the nineteenth-century Vedic scholarship need to be noted. The language of the Ṛgveda is highly obscure. The text is full of allusions and passing references for which no contexts are available. The problem is made worse by the fact that in the era of the Vedic studies no archaeological data were available. In the absence of any guidelines from either the field or the laboratory, a student of the Vedic texts had to depend on his own intuition and guesswork. It is noteworthy that even in the field of literary interpretation, the important clues provided by the description of Soma were ignored (chapter 6). Indeed, if we consider the corpus of secondary work on Vedic texts in its totality, we find that almost all possible interpretations have been placed on record. As an illustration, consider the question of the identity of the Ṛgvedic river Sarayu. The following answers are available: It is the river Sarju in Oudh; it is a river in Punjab; it is the Ṛgvedic Krumu; it is identical with the united course of Śutudrī and Vipāś![37]

In such a chaotic state, it is inevitable that the mindset of the researchers would particularly colour their interpretations. Europe at that time was suffering from the Greek fixation. The benchmark for oriental history was Alexander's eastern campaign. Still older dates were obtained by timidly subtracting a few centuries at a time from the campaign date. As late as 1838, it was being earnestly asserted in Europe that Sanskrit language and literature were post-Alexandrian forgeries patterned on the Greek model.[38]

The assertion that the Ṛgveda was composed entirely within the geographical boundaries of the Indian subcontinent neatly

fitted the official view that Hinduism was the native to India while Islam came from outside. Imagine the damage to the two-nation theory that would have been caused by the assertion that the Indo-Aryans started composing the Ṛgveda when they were in central Asia, Iran or Afghanistan and completed it in India. Interestingly, all the scholars who suggested that the Ṛgveda was partially composed outside India (Hermann Brunnhofer, Alfred Hillebrandt) were from continental Europe rather than Britain.

The canon of the interpretative work on Vedic texts was more or less closed in 1912 with the publication of the influential two-volume *Vedic Index of Names and Subjects* compiled by Macdonell in collaboration with his student Arthur Berriedale Keith. Exercising their editorial prerogative, they decided which view should constitute the mainstream and which view should be consigned to the lowly footnotes. Accordingly, the short chronology and made-in-India label for the Ṛgveda came to constitute the received wisdom on the subject.

Ironically, in 1907 even as *Vedic Index* was being prepared, there came archaeological evidence not from India or Iran but from Boghazkoi (east Turkey), which established the existence[39] of the names of Ṛgvedic divinities in fourteenth century BC (chapter 6). But the literary die had already been cast.

If the nineteenth century was dedicated to language and literature, the twentieth century belonged to archaeology. In the 1920s, the ancient cities of Harappa and Mohenjodaro were discovered. Although no firm dates were available at that time, a time period of c. 2500–1500 BC was tentatively assigned to these cities on the basis of a comparison with the finds in Mesopotamia. Since the Harappan cities seemed to spring from nowhere, it was suggested that they were a corollary of the Mesopotamian civilization. Recent work has shown this suggestion to be unfounded (chapter 5).

Far more significant than the speculation on the origin of the Harappan cities was the speculation on their death. Since the estimated date for the end of these cities neatly coincided with the estimated date for Aryan entry into India, it was asserted in 1947, with more vigour than reason, by (Sir) Robert Eric Mortimer Wheeler (1890–1976) that the Harappan cities came to an end at the hands of Aryan invaders (chapter 5). (This would

make the European conquest of India second in the series.) The British rule in India that had begun with the discovery of the joint Indo-European heritage came to an end with the invention of an Aryan invasion.

Whether the Aryans entered India as invaders or migrants is a matter of detail; in either case it is implied that the Harappan civilization was non-Aryan. The weight of evidence now available goes against the invasion hypothesis. The idea however has persisted and has been met with the counter-idea that the Aryans themselves were the Harappans. This counter-idea can be sustained only by a wholesale rejection of evidence to the contrary.

Over the years, a large body of data has become available from India and abroad. The linguistic and literary evidence of various kinds can now be supplemented with evidence from a variety of fields: archaeology, geomorphology, astronomy, natural history, and history of science and technology. In the following chapters we seek to examine the evidence in its totality with a view to placing the Ṛgvedic people in a composite historical and geographical context.[40]

3

LITERARY SOURCES OF ANCIENT HISTORY

Life is the art of drawing sufficient conclusions from insufficient premises.

—Saṁuel Butler, *Notebooks. Life*

It is a commonplace that ancient India does not provide any exclusive historical documents. History has to be extracted from religious texts. We thus have the Vedic texts, the Purāṇas and the two epics, the Mahābhārata and the Rāmāyaṇa. Another literary source on a par with the Ṛgveda is the Avesta, the sacred book of the Zoroastrians. In addition, valuable information comes from the Buddhist and Jain sources.

VEDIC TEXTS

Vedic texts[1] are priestly books that were composed over a long period of time by a large number of authors. It is not possible to say when their earliest portions were composed, but it appears that the bulk of the Vedic texts were completed before Buddha's time. Vedic texts are a product of an apparently intellectually open tradition, because the various texts went through many revisions and redactions in the hands of a number of independent schools, resulting in a multidimensional corpus. The Vedic texts fall into three classes.

The core of the corpus is made up of the four Saṃhitās ("collection of hymns") of the Ṛgveda, Sāmaveda, Yajurveda and Atharvaveda. Attached to the Saṃhitās are the Brāhmaṇas, which are prose texts devoted to an interpretation of the rituals. The Āraṇyakas ("forest books") are the concluding portions of, or appendices to, the Brāhmaṇas. Āraṇyakas are not connected with the performance or explanation of sacrifices, but with mysticism

and symbolism. The Āraṇyakas form a natural transition to the philosophical texts of the Upaniṣads, the oldest of which are either included in, or appended to, the Āraṇyakas.

The Saṃhitās and the Brāhmaṇas together are known as śruti ("heard", implying revelation), while the Āraṇyakas and the Upaniṣads, as well as the philosophy contained in them, are called Vedānta ("the end part of the Vedas"). The total number of Upaniṣads is very large; a later Upaniṣad, the Muktikā, says there are 108 of them. It is not known whether the number was quoted because of its sanctity or because that was the exact enumeration.

The third class of Vedic texts, the Kalpasūtras, contain detailed instructions for performing rituals. They are divided into four classes: Śrautasūtras, Gṛhyasūtras, Dharmasūtras and Śulvasūtras. The Śrautasūtras, as the name implies, deal with the great sacrifices mentioned in the śruti literature. Directly attached to them are the Śulvasūtras, which give exact rules for the measurement and construction of places of sacrifice and fire altars. (The word śulva means a cord or a string.) Śulvasūtras include India's oldest works on geometry. The Gṛhyasūtras give the rules for the numerous ceremonies applicable to the domestic life of a man and woman from birth to death. Directly connected with them are the Dharmasūtras which deal with the religious and secular laws. Manusmṛti, or to give its full name, Mānava Dharmaśāstra, the well-known metrical treatise on the Hindu customary law, is a later work than the Dharmasūtras. The Kalpasūtras are one of the six Vedāṅgas ("parts of the Vedas"); the other five being Śikṣā (phonetics), Vyākaraṇa (grammar), Nirukta (etymology), Chandas (metrics) and Jyotiṣa (astronomy). Tables 1 and 2 list the major Vedic texts.

Ṛgveda

The Ṛgveda is a collection of 1,028 hymns (sūktas) divided into 10 books (maṇḍalas). These 1,028 hymns include 11 Vālakhilya hymns which are sometimes excluded from the Ṛv Saṃhitā. The first and the last maṇḍalas both contain 191 hymns, suggesting some deliberation. The number of verses (ṛcas) in a hymn varies from just one (Ṛv 1.99) to 58 (Ṛv 9.97). The total number of verses is 10,462; thus the average number of verses per hymn is 10. The

TABLE 1: A guide to major Vedic and Vedantic texts

Veda	*School*	*Brāhmaṇa*	*Āraṇyaka*	*Upaniṣad*
Ṛg	Śākala	Aitareya Kauṣītakī[1]	Aitareya Kauṣītakī[1]	Aitareya Kauṣītakī[1]
Sāma	Jaiminīya Rāṇāyanīya Kauthuma	Pañcaviṁśa[2,3] Ṣaḍviṁśa Jaiminīya Upaniṣad Chāndogya		Chāndogya[4] Kena[5]
Yajur Kṛṣṇa	Taittirīya Maitrāyaṇī Kāṭhaka Kapiṣṭhala- Kathā	Taittirīya	Taittirīya	Taittirīya Maitrāyaṇī Kaṭha Śvetāśvatara
Yajur Śukla (Vājasaneyī Saṃhitā)	Kaṇva Mādhyanandina	Śatapatha[3]	Śatapatha	Bṛhadāraṇyaka[4] Īśa
Atharva	Śaunaka Paippalāda	Gopatha		Muṇḍaka Praśna Māṇḍūkya

[1] Also known as the Sāṅkhāyana.
[2] Also known as the Tāṇḍya Mahā Brāhmaṇa.
[3] One of the two most important Brāhmaṇas.
[4] One of the two most important Upaniṣads.
[5] Also known as Talavakāra Upaniṣad; related to the Jaiminīya Upaniṣad Brāhmaṇa.

totality of hymns is also divided into eight parts (aṣṭakas), which are themselves divided into chapters (adhyāyas), which in turn are divided into groups of five verses. The maṇḍalas are also divided into recitations (anuvākas).

The Ṛgveda is not a single-author book. Its nucleus is the maṇḍalas 2 to 7 which are composed by named priestly families consisting of sons and pupils (table 3). In each of these maṇḍalas, the arrangement of hymns follows a pattern. For example, the first group of hymns is addressed to Agni, the second to Indra, and the rest to other deities.

Maṇḍala 1 can be divided into two parts. The second part is older and consists of assorted hymns by various families. The first part was added later. Maṇḍala 8 is mostly, but not entirely,

TABLE 2: A guide to major Vedic Kalpasūtras[1]

Ṛgveda	*Sāmaveda*	*Yajur Kṛṣṇa*	*Yajur Śukla*	*Atharvaveda*
		Stage[2] I		
Āśvalāyana[3] SG	Lāṭyāyana[4] S	Baudhāyana[9] SGDSv		Kauśika[15] G
Kauṣītakī G	Gautama[5] D Gobhila[6] G	Mānava[10] SGSv		
		Stage II		
Sāṅkhāyana SG		Bharadvāja[9] SG Āpastamba[9] SGDSv Kāṭhaka[11] G	Kātyāyana[13] SSv Pāraskara[14] G	
		Stage III		
Vasiṣṭha D	Drāhayāyaṇa[7] S Khādira[8] G Jaiminīya SG	Hiraṇyakeśi[9] SGD		Vaitāna[16] S
		Stage IV		
		Varāha[12] SG Agniveśya G Vaikhānasa SG		

[1] S = Śrauta, G = Gṛhya, D = Dharma, Sv = Śulva.
[2] Stages are arranged in order of decreasing antiquity, determined by collation of texts. Stage IV may be as recent as zero AD.
[3] Related to Aitareya Brāhmaṇa.
[4] Related to Pañcaviṁśa Brāhmaṇa and Kauthuma school.
[5] Probably the oldest Dharmasūtra.
[6] Follows 4. One of the oldest and the most complete in its class.
[7] Rāṇāyanīya school.
[8] Follows 7.
[9] All belong to Taittirīya school.
[10] Belongs to Maitrāyaṇī school. The Gṛhyasūtra introduces worship of Vināyaka.
[11] Related to 10.
[12] Belongs to the Maitrāyaṇī school.
[13] Related to Śatapatha Brāhmaṇa.
[14] Follows 11. Basis of Yājñavalkya's Dharmaśāstra.
[15] Belongs to Śaunaka's school. Includes magical and other practices related to its Veda.
[16] Also belongs to Śaunaka's school. Neither old nor original.

due to the Kaṇvas, who are also the authors of the first part of maṇḍala 1. At one time, maṇḍala 8 was considered to be the last of the maṇḍalas. That is why the Vālakhilya hymns are inserted in it, although they are not at the end but after hymn number 48. Maṇḍala 9 consists of 114 multi-authored hymns, almost all of

TABLE 3: Family authorship of the Ṛgvedic maṇḍalas

Maṇḍala	*Number of hymns*	*Family*
1	191	Misc.
2	143	Gṛtsamada
3	62	Viśvāmitra
4	58	Vāmadeva
5	87	Atri
6	75	Bharadvāja
7	104	Vasiṣṭha
8	103*	Kaṇva + Misc.
9	114	Misc.
10	191	Misc.

* Includes the 11 Vālakhilya hymns.

which are addressed to Soma Pavamāna. It was prepared by taking out relevant hymns from the other maṇḍalas. These hymns are arranged according to the metre. To these nine maṇḍalas was added the last maṇḍala which is thus the most recent, although it is very likely that it also contains some old material. The Soma hymns from it were also transferred to the ninth maṇḍala. There are still six dedicated Soma hymns outside the ninth maṇḍala.

The additive feature of the Ṛgveda is encountered later in the Rāmāyaṇa also. To the existing work, most of the recent work was added at the beginning and at the end. It is certain that before the other Saṃhitās came into existence, the Ṛv Saṃhitā (including the tenth maṇḍala) had already assumed practically the same form in which we find it today. There is no uniformity in the quality and subject matter of the hymns. To take an extreme example, there are a few late passages in the Ṛgveda (1.127.6–7; 10.61.5–8) which nineteenth-century British prudery would print only in Latin translation.

Of particular interest from a historical point of view are the dānastuti (praise of gifts) hymns, which commemorate the liberality of princes towards the priestly singers employed by them. They are all of a later date, occuring in maṇḍalas 1 and 10 and in the Vālakhilya section. They incidentally provide historical data about the families and genealogies of the poets and the princes, as well as about the names and homes of the Vedic tribes.

A number of help-books were prepared to facilitate the study of the Ṛgveda (as well as other Vedas) and to protect it against alterations. Śākalya's Padapāṭha ("word-text") separately lists each word of the Ṛgveda and parts of compound words. Śaunaka's phonetic text, Prātiśākhya ("the text for each branch"), shows how the Pada text is to be transformed into the Saṃhitā text. Anukramaṇīs (indexes) of Śaunaka provide a catalogue of the Ṛgvedic hymns as well as their metre, deities and authors. Kātyāyana's Sarvānukramaṇī ("list of all things") gives in the sūtra form the first few words of every hymn, the number of verses, the deities and the metre. In addition, it gives the name and the family of the author.

Śaunaka, the teacher of Āśvalāyana, is the author of two more works. His Bṛhaddevatā gives in metrical form a catalogue of the gods worshipped in various hymns, along with the associated myths and legends. The second work of Śaunaka, the Ṛgvidhāna, describes the magic power one can obtain by reciting the hymns or verses of the Ṛgveda. Śākalya is older than Śaunaka as well as Yāska (c. 600 BC) who quotes Śākalya in his Nirukta, the influential work on Vedic etymology. Nirukta in turn makes use of Nighaṇṭus, the collection of rare or obscure Vedic words. The Ṛgveda already had a fixed form in Yāska's time, which is identical to the present-day text.[2]

Significantly, the Ṛgveda contains a few passages that Śākalya did not analyse in the Padapāṭha but merely repeated them in the Saṃhitā format: Ṛv 1.190.1–3; 7.59.12; 10.20.1; 10.121.10. This suggests that Śākalya did not acknowledge them as being truly Ṛgvedic.[3] A vital feature of the Ṛgveda was its evolution during the formative stages. There were obviously independent schools studying it and contributing to it. Today when we talk of the Ṛgveda, we mean its Śākala recension, which has come down to us apparently complete. But there were others as well. We have already noticed the 11 Vālakhilya hymns, which are probably the sole surviving fragment of a complete recension. In addition to the Vālakhilya, we also have the Khilasūktas, a set of 36 hymns of the Vāṣkala (or Baskala) recension. These hymns, inserted at various places in the Śākala recension, are considered spurious. There are also some mantras which are cited in the Baudhāyana Śrautasūtra of the Ṛgveda but do not figure in the Saṃhitā.

It is thus clear that the Ṛv Saṃhitā as it stands today does not represent the contemporaneous Ṛgvedic tradition in its entirety. Rather, it represents only those portions which a particular school decided to preserve. The criterion used for inclusion in the canon is not known. There is no preface to the Ṛv anthology. While the Vedic texts have preserved the names of the authors of the hymns, and even verses, they do not record the name(s) of the editor(s). Tradition records that two of the Ṛgvedic families, Vasiṣṭha and Viśvāmitra, were engaged in bitter rivalry. The fact that both their compositions figure in the compilation speaks highly about the editor(s). The Sāmavidhāna Brāhmaṇa and Taittirīya Āraṇyaka mention, in the list of teachers, Vyāsa Pārāśarya, a pupil of Viśvaksena, but no details about his work are given. The name Vyāsa itself is meaningful. The Mahābhārata and the Purāṇas state that the (single) Veda was divided into four by Parāśara's son Kṛṣṇa Dvaipāyana, who consequently was called Vyāsa. This legend cannot be true in its entirety. It can at best hold in the case of the Ṛgveda, because we know that the other Saṃhitās are decidedly younger.

Vyāsa is placed at the end of the Bhārata battle;[4] he is also the progenitor of the two half-brothers Dhṛtarāṣṭra and Pāṇḍu. The Ṛgveda contains hymns that belong to this epoch. Ṛv (10.98) is authored by Devāpi, a cousin or brother of the Kuru king Śantanu who is said to have preceded the battle by four generations. Also, there are hymns (Ṛv 9.5–24) by Asita and his son Devala, said to be contemporaries of the Pāṇḍavas. It is thus certain that the Ṛgveda was not closed before Vyāsa's time. In view of the tradition, we can credit Vyāsa with its closure and place it at about 900 BC, the approximate date assigned to the Bhārata battle (chapter 4). It is certain that the contents of the Ṛgvedic verses were not changed after their composition. It however seems reasonable to suppose that during their oral transmission, their phonetics (including euphonics) underwent gradual, though unconscious, change. In other words, while the content of the Ṛgvedic verses carries the signature of the times of their authors, their language bears the stamp of the redactors and their times.[5]

The Ṛgvedic language is much older than Sanskrit (saṃskṛta literally meaning "put together") which was the name given to the language on its regulation by the grammarians. The term

Sanskrit first appears in the Rāmāyaṇa to denote the "refined" language as distinct from Prakrit (prākṛt, "natural"). The name Sanskrit is however often applied retrospectively to include the Vedic language. Even in Yāska's time, many Vedic words were already obsolete.

In the fourteenth century AD, Sāyaṇa (d. 1387), prime minister to the king of Vijayanagara (now Hampi in Karnataka), wrote a commentary on the Ṛgveda. Such works as Sāyaṇa's are of great value today because they were composed in unselfconscious times. There is now a flourishing industry which seeks to establish the Ṛgveda as a modern scientific text of great contemporary value. A large number of "experts" claim to have discovered in the Vedic passages references to the latest scientific discoveries. (What use is the so-called modern scientific content of the Vedas, if it can come to light only after the West has made scientific discoveries independently and explicitly and if even after that, the Vedic content cannot lead to further developments? Also, by definition a scientific conclusion ceases to be scientific if it is presented as a revelation.) The modern age is the age of the artisan, whereas the Vedas are priestly books. It therefore appears rather incongruous when one searches for (and finds!) details of artisanal activities like metallurgy in the priestly literature. Such "experts" would do well to take note of what Sāyaṇa and others had to say by way of their pre-science age interpretation of the so-called "scientific" passages of the Vedas.

Sāmaveda

Sāmaveda, the Veda of the Sāman chants, consists almost entirely of verses taken out of the Ṛgveda for rhythmical chanting by the Udgātṛ priests at the time of sacrifices. It consists of two parts: Ārcika ("collection of ṛcas") and Uttarārcika. The Ārcika consists of 585 ṛcas (single verses) addressed to three deities: Agni (verses 1–114), Indra (115–466), and Soma Pavamāna (467–585). To each of these verses corresponds a single melody (Sāman) named after the seer who is supposed to have discovered it. The Uttarārcika consists mostly of tṛcas (three-line verses) or pragāthas (two-line verses) and occassionally complexes of more verses, but never of single verses. Very often the first verse of a tṛca occurs as

a verse in the Ārcika, whose melody is then applied to the whole of the tṛca. There are however verses in the Ārcika which do not figure in the Uttarārcika and vice versa.

There are in all 1,810 individual verses in the Sāmavėda. The number comes down to 1,549 if we exclude the repetitions. Of these, all but 75 are found in the Ṛv Saṃhitā. Historically, therefore, the Sāmaveda has little or no significance. Its secondary literature, however, is of great value. Its Brāhmaṇas—Pañcaviṁśa and Jaiminīya—are among the oldest. The Jaiminīya is quite unlike any other Vedic Brāhmaṇa; it is the only one whose stories have a strong element of folklore, which at times display a boldness one normally does not associate with religious literature.

Yajurveda

The Yajurveda is the manual of the Adhvaryu priest. At a great sacrifice, the prescribed Ṛgvedic hymns were recited by the Hotṛ, while the appropriate melodies (Sāmans) were chanted by the Udgātṛ. The rest of the work was done by the Adhvaryu priest. His work ranged from the selection and measurement of a plot of land for the sacrificial altar down to reciting the Yajur formulae and offering oblations to the sacred fires. No wonder then that the Ṛgveda describes an Adhvaryu priest as suhastya (adept) (Ṛv 10.41.3), while a Hotṛ priest is called suvāc (of good speech) (Ṛv 10.110.7) and sujihvā (good-tongued) (Ṛv 1.13.8).

Since variation is more natural in manual work than in work involving the tongue or throat, the Yajur corpus is wider than any other. It has two versions: Kṛṣṇa (black) and Śukla (white). In the Black Yajur, the poetical mantra part and the prose Brāhmaṇa part form one complete whole. Thus, Taittirīya Saṃhitā and Brāhmaṇa though separately named seem to presuppose each other. Black Yajur prose is the oldest prose in the Vedic/Sanskrit language. Later came the Vājasaneyī Saṃhitā, the so-called White (or pure) Yajurveda, because it gives only the mantra part; its Brāhmaṇas constitute separate texts. There are as many as six recensions of the Yajurveda, four of the Black and two of the White. A very large number of Kalpasūtras are associated with the Black Yajur. In particular, it is the only Veda to which the Śulvasūtras are attached.

Atharvaveda

While the Ṛgveda, Sāmaveda and Yajurveda complement each other by taking care amongst themselves of all aspects of the great sacrifices, the Atharvaveda stands apart and lower in the hierarchy. It is a collection of 730 hymns containing some 6,000 stanzas, divided into 20 books (kāṇḍas). About one sixth of the text, including two entire books (15 and 16), is written in prose, similar in style and language to the Brāhmaṇas; the rest of the text is poetry in the usual Vedic metre, but without the rigour of the other Vedas. The Saṃhitā comes in two recensions, the more influential Śaunakīya, and the Paippalāda. Taken as a whole, the Atharvaveda is a collection of charms and spells. These charms required the use of appropriate herbs. Accordingly, the Atharvaveda is the oldest treatise on Indian medicine just as the Sāmaveda is on music.

The Atharvaveda was for a long time not considered a Veda; one of the most well-known words for the Vedas was trayī, meaning a triplet. Once the Atharvaveda was elevated to the status of a Saṃhitā, it was provided with secondary literature. Its Gopatha Brāhmaṇa has hardly any connection with the Saṃhitā and is in fact no more than a collection of slightly modified quotations (without acknowledgement) from other sources. Even though the Atharvaveda is not connected with sacrifices, it was, in analogy with the other Vedas, furnished with a Śrautasūtra—self-consciously designated Vaitānasūtra, Vaitāna meaning sacrificial. Strictly speaking, it is the Śrautasūtra of the last kāṇḍa of the Atharvaveda and not of the entire Veda. This Śrautasūtra is even younger than the Atharvaveda's Gṛhyasūtra, the Kauśika, in contrast to the other Vedas where the Śrautasūtras are invariably older.

When we say that text A is older than B, this does not necessarily mean that the whole of A is older than whole of B. Rather, it means that A was closed earlier than B, so that the youngest portions of A are older than the youngest portions of B. It is in fact very likely that the oldest portions of the Saṃhitās, Brāhmaṇas and Kalpasūtras are contemporaneous by virtue of being complementary.

ASTRONOMICAL DATING

There are stray astronomical references in the secondary Vedic texts that can in principle be dated. Observations of the apparent

solar orbit around the earth was a regular practice in ancient times. This led to the discovery of the four cardinal points: spring and autumn equinoxes when the sun rises exactly due east; summer solstice when the sunrise point is farthest to the north; and winter solstice when it is farthest to the south. Suppose on an equinox or solstice day, we stick two poles in the ground to define a line pointing towards the rising sun. Year after year, the line will point towards the cardinal sunrise, but the stellar background will be different. The cardinal point is seen to shift westwards with respect to the distant "fixed" stars; the phenomenon is known as the precession of the equinoxes.[6] Stars or star groups that were used as reference points for the movement of the sun (and the moon) are called nakṣatras.

We can imagine a clock in which the rising sun on a cardinal day is the tip of the clock hand and the nakṣatras are the digits on the dial. The hand of the clock moves at a rate of 1° in about 72 years. The direction of the movement is opposite to the sense in which the nakṣatras and the zodiacal signs are listed in the literature. Since we know the rate at which the clock hand moves, we can easily calculate which nakṣatra would have been behind the sun at a given time in the past. Conversely, given an ancient observation linking a known equinox or solstice with a nakṣatra, we can assign a date to the observation.

While the method by itself is very precise there are practical difficulties. It is not possible to ascertain which star is exactly behind the sun, because at daybreak the stars become invisible. Stars can be seen only some time before sunrise. When we are told that such and such nakṣatra marked the spring equinox, we have no way of knowing the error in the observation. If the nakṣatra is off by 5°, the epoch would be off by 360 years. (For fixing our ideas we may note that the sun or the moon appears to be half a degree across in the sky.) The Śatapatha Brāhmaṇa (2.1.2.2–3) ordains that a ritual fire be lit under the nakṣatra Kṛttikā (the star group Pleiades) because it rises in the east. This statement is taken to mean that at the time of the vernal equinox, the sun was in front of the Pleiades. To get an idea of the numbers involved, let us calculate the epoch of this observation assuming it to be rigorously true. The epoch turns out to be 2300 BC.[7] But in view of the uncertainties involved, this date can only be taken as indicative.

This Śatapatha observation is repeated in the Baudhāyana Śrautasūtra (25.5) which goes on to record (25.7) an astronomical observation of its own. It tells us that the sun reaches the nakṣatra Dhaniṣṭhā, also called Śarviṣṭhā (Alpha Delphini), on the winter solstice. The statement also occurs in the astronomical treatise Vedāṅga Jyotiṣa (Ṛv-recension, verse 6). The epoch of this statement if rigorous is about 1400 BC.[8] (If any one had kept these two statements side by side and tried to reconcile them he would have discovered the precession of the equinoxes.) We have here an instance of a compilation which contains matter belonging to widely separated points in time.

THE PURĀṆAS AND EPICS

The Ṛgveda and the associated texts are priestly books in which historical and geographical references are incidental. These faithfully preserved references are valuable benchmarks, but cannot by themselves provide a connected account of ancient history. There is another class of literary texts, the Purāṇas, which purport to provide genealogical lists of ancient kings. In addition there are the two epics, the Rāmāyaṇa and the Mahābhārata. The Rāmāyaṇa has practically no historical value, but the Mahābhārata falls in a different category.

The Mahābhārata, or the "great battle of the descendents of king Bharata", contains as its core the description of the eighteen-day fight between the Kauravas and Pāṇḍavas. The battle was won by the Pāṇḍavas who, after a few years of post-battle rule, placed Arjuna's grandson Parīkṣit on the throne of Hastināpura. Parīkṣit was succeeded by his son Janamejaya. It was during his reign that the epic was recited by Vaiśampāyana, who had learnt it from Vyāsa. It is said that after arranging the four Vedas, Vyāsa composed the Mahābhārata.

In its present form, the Mahābhārata consists of more than 100,000 ślokas, making it the longest poem in the literary history of the world. A critical edition of the Mahābhārata[9] has been prepared by the Bhandarkar Oriental Research Institute, taking the oldest extant manuscript (seventh–eighth century AD) as the benchmark.[10] The critical edition contains a total of 82,564 ślokas. The matter is divided into 18 books known as parvans,

with the 19th book, the Harivaṃśa, as a supplement. The books are of unequal length; the longest (Śāntiparvan) contains over 14,525 ślokas, while the shortest (Mahāprasthānaparvan) only 120.[11] The first, or the Ādiparvan, contains a few direct statements: that the work contained only 8,800 ślokas, to begin with; that at one time there were 24,000 ślokas before the episodes (upākhyānas) were added; and that it had three beginnings.[12] This suggests that the epic underwent three stages of development from the time it assumed a definite shape. Āśvalāyana's Gṛhyasūtra mentions both the Bhārata and the Mahābhārata. The two are also named by Pāṇini, implying that in about 450 BC both the versions were extant.[13]

The Mahābhārata figures in six extant copperplate inscriptions dated AD 423–464. These copperplates were found in the valley near Khoh village in central India, not far from River Tons. The inscriptions in Sanskrit deal with land grants made by maharajas ruling from a hill or place called Uccakalpa. The years mentioned in the inscriptions are in the Kalacuri (or Chedi) era, the zero year of which corresponds to AD 248.[14] This suggests that the Uccakalpa kings were the feudatories of the Kalacuris, who ruled near modern Jabalpur. Of particular interest is the copperplate dated AD 463, describing a land grant made by Maharaja Sarvanātha. The Sanskrit inscription on it refers to the Mahābhārata as the Śatasāhasrī-saṃhitā, "collection of a hundred thousand [ślokas]."[15] This proves conclusively that by AD 463 the epic had already assumed the form as we know it today. It is also clear from various inscriptions and references that the Mahābhārata was recognized as not merely a heroic poem but as a Dharmaśāstra of long-standing authority.

The Rāmāyaṇa is an epic poem, which describes the life and travails of King Rāma of the Ikṣvāku dynasty. In its present form it consists of about 24,000 ślokas, arranged in seven books known as kāṇḍas. It has been shown that the Rāmāyaṇa originally consisted of only five books (books 2–6), composed by a single author, Vālmīki. At one time, the end of the sixth book (Yuddhakāṇḍa) was evidently the end of the whole poem. The last book (Uttarakāṇḍa) was added later. There are several passages in the first book (Bālakāṇḍa) that conflict with statements in later books. The first book contains two tables of contents, one

of which takes no notice of the first and the last book. It must therefore have been prepared before these two books were added.[16] It is interesting to note that the old table of contents was not deleted. In addition, there have been some interpolations in the original books as well.[17]

There are strong reasons to believe that the original part of the Rāmāyaṇa was completed before the epic kernel of the Mahābhārata. Episodes from the Mahābhārata are not mentioned in the Rāmāyaṇa, while the converse is true. Also, the Droṇaparvan of the Mahābhārata quotes two lines as Vālmīki's. These lines indeed occur unaltered in the Yuddhakāṇḍa of the Rāmāyaṇa. In the Āraṇyakaparvan (verses 277–291) of the Mahābhārata, there is a Rāmopākhyāna, the "episode of Rāma", which is based on Vālmīki's Rāmāyaṇa and presupposes the audience's familiarity with it.[18] It is likely that the Rāmāyaṇa as we know it was composed in the interval between the Bhārata and the Mahābhārata versions. The rewriting of both the Mahābhārata and the Rāmāyaṇa is attributed to the Bhṛgus whose ancestor Paraśurāma repeatedly and unnecessarily figures in the texts.[19]

There are 18 Purāṇas. It is believed that they have all evolved from an originally single Purāṇa. Internal evidence suggests that they were altered at different times. They freely borrow material from each other. The older ones are considered more reliable. (It has, for example, been pointed out that the more recent the Purāṇa, the more amorous is its treatment of the Kṛṣṇa legend.) The following is the list of Purāṇas, in what is believed to be a generally decreasing order of antiquity: Brahma, Vāyu, Matsya, Brahmāṇḍa, Viṣṇu, Bhāgavata, Garuḍa, Agni, Padma, Liṅga, Kūrma, Mārkaṇḍeya, Bhaviṣya, Nārada, Brahmavaivarta, Varāha, Vāmana and Skanda. All of them are either pro-Viṣṇu or pro-Śiva. Only the first 13 (up to Bhaviṣya) contain some material which is historical in nature.[20]

Formally, a Purāṇa has five lakṣaṇas (characteristics), that is, it deals with five topics, all of which, however, may not be present in all the Purāṇas. The five topics are: (i) Sarga, the creation; (ii) Pratisarga, the secondary creation; (iii) Vaṃśa, genealogies of gods and ṛṣis; (iv) Manvantara, 'the period of a Manu' (chapter 4). (Six periods have already passed. The current one is the seventh, headed by Manu Vaivasvat (Manu, son of Vivasvat, the

sun) who is regarded as the progenitor of the present race of human beings and, more particularly, of the rulers); and (v) Vaṃśa-anucarita, the history of the ruling dynasties.[21]

We thus see that the Purāṇas do not treat political history as secular but as being subservient to the divine scheme of creation. In this context the name of the last of the historical Purāṇas, Bhaviṣya Purāṇa, is significant, combining as it does the future (Bhaviṣya) with the past (Purāṇa). The Bhaviṣya Purāṇa closes the past at a chosen point in time, pretends to be stationed at that point for times to come and records subsequent history as if it were being prophesied! Even this framework would have been acceptable, had the historical data been treated with respect. But unfortunately the Purāṇas were not considered sacrosanct. While the Vedas were reserved for study by priestly schools, the Purāṇas and the epics were narrated to the public at large and used to define and fulfil its religious needs. Accordingly, they were often recast to suit the prevailing requirements of the narrators as well as listeners.

In the process of their development as sectarian literature, the historical content of the Purāṇas was twisted out of shape. Kings and their dynasties were intermixed; ṛṣis and gods freely interacted with the kings; kings were given reigns of tens of thousands of years, apparently to fill the non-historical timespan of a Manvantara; and dead kings and ṛṣis popped up at odd places and odd times. In addition, absurd stories were concocted by taking literal meaning of proper names or by punning on them. Sītā ("furrow") sprang from a furrow made by King Janaka while ploughing the ground. Śantanu's queen Gaṅgā was the river itself. Jarāsandha ("joined by Jarā") was born in two halves which were put together by a Rākṣasī named Jarā. Droṇa was so called because the seed of his father, which fell at the sight of a nymph, was preserved by him in a droṇa, an oval-shaped small vessel. Māndhātṛ was so named because on his birth Indra declared: "māṃ dhāsyati" (I'll bring him up).[22] There was a genuine difficulty also. Confusion has been caused by similarity of names which belonged to different dynasties or which were far removed from each other in time.

It is certain that, to begin with, the Purāṇas represented an authentic tradition. Collection and preservation of the lore about

the kings was recognized as an important task and entrusted to the sūtas (bards) who were not Brahmins. The Ṛgveda makes references not only to contemporaneous events but also to bygone times. The Brāhmaṇas narrate many stories about kings. There must therefore have been an independent historical databank for the Vedic authors to draw from. Furthermore, the genealogies go back to the founders of the royal dynasties. But it is not necessary that the composer of the first Ṛgvedic hymn should have lived in the reign of the first ruler. Thus it is likely that the Purāṇic tradition is even older than the Vedic. In any case, the Vedic texts regard the Purāṇic tradition as independent and complementary.

Atharvaveda (10.7.24) mentions Purāṇa (in singular) along with Ṛcas, Sāmans, and Yajus. Atharvaveda (15.6.11) recognizes the lore of the bards as a class of literature called Itihāsa Purāṇa (story and legend). Chāndogya Upaniṣad (7.1 and 7.7) and early Buddhist books (e.g., Sutta Nipata 3.7) call Itihāsa Purāṇa the fifth Veda. Āpastamba's sūtras cite three doctrines from a Purāṇa (without saying which one), and also from the Bhaviṣyat (cf. Bhaviṣya) Purāṇa (2.9.24.6). Although the citations are not related to royal genealogies, they do point towards the Purāṇas being considered a respected authority. Later, in AD 620, Bāṇa in his Harṣacarita refers to the Vāyu Purāṇa which is recognized as one of the oldest.

While the Purāṇic databank fed information to the Vedic texts, there was also a reverse process in action. Allusions in the Ṛgveda were later developed into stories. Thus Jaiminīya Upaniṣad Brāhmaṇa often acts as a bridge between the terse Ṛgvedic allusions and full-blown Mahābhārata stories. There is a single verse in Ṛv (1.105.17): "Trita, when buried in the well, calls on the Gods to succour him. That call of his Bṛhaspati heard and released him from distress." This reference is expanded into a full tale in Jaiminīya Upaniṣad Brāhmaṇa (1.184) and becomes a still more elaborate story in the Mahābhārata (Śalyaparvan 9.35.3–7, 12, 14–35, 44–51).[23]

The Purāṇas as we have them now are a curious mix of history, mythology and nonsense. But still they are our only source of ancient history. Rejecting them outright would be like throwing the baby with the bathwater. Minus the oral tradition, Indian

history can only begin with King Aśoka or at most with Buddha before him. In the next chapter, we shall attempt to extract political history out of the Purāṇas.

AVESTA

The Avesta is the collection of Zoroastrian scriptures. Zoroastrianism was the state religion of three great Iranian empires, which flourished during the millennium 559 BC to AD 651. The first empire was founded by the Persian king Cyrus (ruled 559–530 BC) of the Achamenian family. The characteristic Zoroastrian symbol, consisting of a circle with the upper part of a male figure in it and a wing on either side, first appeared on the sculpture outside the tomb of Darius I the Great (522–486 BC)[24]. The dynasty came to an end in 331 BC when its last king Darius III was defeated by Alexander. The anti-Zoroastrian, Hellenistic, Seleucid dynasty ruled from 311 BC until about 246 BC when it was overthrown by a Parthian-speaking Parni chieftain called Arshak (Arsaces to the Greeks). The Arsacid dynasty came to an end in AD 211 when Ardashir, son of Papak, established the Sasanian dynasty.[25] The last king of this dynasty, Yazdegerd III (the name is spelt variously), was defeated by the invading Arabs in AD 642 in the battle of Nahavand, essentially marking the end of Zoroastrianism in Iran.[26]

The Avestan texts show clear signs of a structure. The oldest part of the Avesta is the Gathas, a set of 17 hymns composed by Zarathushtra himself, in metrical form like the Ṛgvedic hymns. Additional texts were composed and transmitted orally from generation to generation. In the process, they underwent improvisation till they were finally written down in the Sasanian period. The Avesta proper consists of three parts: Yasna, Visperad and Vendidad. The Gathas are included in the Yasna which along with the Visperad constitutes the liturgy for the priestly ritual.[27] The Vendidad, a corruption of the term Videvdad, "the law against demons", is a prose work "devoted to rules about the maintenance of purity and its restoration after pollution".[28] In addition, it contains other assorted matters.

Apart from the Avesta proper, there is the Khorda Avesta, or younger Avesta (younger linguistically). It consists of short

prayers recited not only by the priests but also by the faithful. These prayers are the five Gahs, the 30 formulae of the Sirozah, three Afringan and the six Nyayis. It is usual to include in the Khorda Avesta, the Yashts, or hymns to individual divinities. As in the case of the Vedic texts, even the later parts of the Avesta may contain material that is very old.[29]

The language of the Avesta is called Avestan, because it is known only from this source. When the Avestan canon was closed, the spoken language was middle Persian, or Pahalvi. Pahalvi texts on the Avesta are a great help in interpreting the contents of the Avesta, especially the archaic Gathas. The most important Pahalvi text is Bundahishn, or creation.

The most remarkable aspect of the Avesta from our point of view is the fact that its language is so closely related to the Ṛgvedic language that one cannot be studied without the help of the other. The differences in grammar are very small. The chief difference lies in certain well-defined phonetic changes. "It is quite possible to find verses in the oldest portion of Avesta which simply by phonetic substitutions according to established laws can be turned into intelligible Sanskrit".[30] The greater part of the vocabulary is common, particularly in the field of religion and culture. (See table 4, which can be made as long as one wishes). Unlike Sanskrit which has remained where Pāṇini left it, Avestan made way for later languages.

In passing, we may note that a number of modern Persian-Urdu words have their Sanskrit counterparts and no doubt belong to Iran's pre-Islamic joint Vedic-Avestan heritage (table 5). A correct appraisal of the Avesta can be made only by juxtaposing it with the Vedic texts. In the Gathas, Zarathushtra refers to himself as a zaotar (Sanskrit hotṛ), sacrificing priest, and a manthran (mantrin), a mantra-maker. In the younger Avesta, he is spoken of as an athaurvan (atharvan), a fire priest. Tradition records that Zarathushtra was making preparations for a Haoma (Soma) sacrifice on a spring festival when he received his first inspiration.[31]

The Ṛgveda refers to a belief in a cosmic law that ensures existence in an orderly manner. This eternal law is called ṛta (in the Avesta, asha). It symbolizes the inherent unity and regularity in the universe. There is an ethical aspect also: Ṛta governs human behaviour by treating virtue as a part of the natural order. The

TABLE 4: Ṛgvedic and Avestan vocabulary

Sanskrit	*Avestan*	*Meaning*
Apām Napāt	Apam Napat	son of water, a divinity
Ārya	Arya	a people
Āryaman	Airyaman	member of a religious sodality
asura	Ahura	lord
atharvan	athaurvan	fire priest
deva	daeva	'god' in Ṛv, demon in Av
hiraṇya	zaranya	gold (zar in Persian/Urdu)
hotṛ	zaotar	sacrificing priest
jihvā	hizva	tongue
kṣetra	khshathra	field
makṣa	maksi	fly
Mitra	Mithra	a divinity
Nābhānediṣṭa	Nabanazdishta	in Ṛv, proper name (s/o Manu); in Av, adjective 'nearest in relation'
Nāsatya	Nanhaithya	a divinity in Ṛv, demon in Av
Pṛthu	Parathu	broad, also proper name in Ṛv. Cognate with Engl. flat and plateau
ṛṣṭi	arsti	spear
senā	haena	army
soma	haoma	a drink
Vṛtrahana	Varathraghna	slayer of enemy
yajña	yasna	sacrifice
Yama	Yima	proper name
s/o Vivasvat	s/o Vivahvant	—do—

Ṛgveda also contains strands of a competing philosophy which glorifies might. Ṛta is represented by Varuṇa, who is called wise Asura, the wise lord (Ṛv 1.24.5) whereas the symbol of power is Indra who is called sahasra-muṣka, "with thousand testicles" (Ṛv 6.45.3). The contrast between the ethical Varuṇa and the mighty Indra is beautifully brought out in Ṛv (4.42.1–6). Varuṇa declares: "I, Varuṇa, am the king; first for me were appointed the dignities of Asura. I let the dripping waters rise up, through ṛta I uphold the sky. By ṛta is the son of Aditi the lord who rules through ṛta." Indra in his turn declares: "Men who ride swiftly, having good horses, call on me when surrounded in battle. I provoke strife, I, the bountiful Indra. I whirl up the dust, my strength is overwhelming. . . . No godlike power can check me, the

TABLE 5: Persian-Urdu words with Sanskrit counterparts

Sanskrit	*Persian/Urdu*	*Meaning*
āpat	afat	misfortune
aśva	aspa	horse
cakṣu	chashm	eye
duhitṛ	dukhtar	daughter (dhi in Punjabi)
dvāra	dar	door
grahīt	girift	gripped
hiraṇya	zar	gold
kṛṣi	kisht	agriculture
kṣīr	sheer	milk
saptaḥ	hafta	week
stan	pistan	breast
tṛṣṇa	tishna	thirsty > thirst
uṣṭra	ushtur	camel
vṛhi	biran	rice

unassailable. When draughts of Soma, when songs have made me drunk, then both the unbounded regions grow afraid".[32]

In this particular hymn, the poet refuses to make any value judgement between Varuṇa and Indra; he appeals to both for gifts and blessings. There is however no doubt that in the Vedic hierarchy, Indra ranks supreme. He has the largest number of hymns addressed to him, nearly 250, that is about one-fourth the total number. Varuṇa is invoked in far fewer hymns than either Indra or Agni (about 200 hymns) or Soma (over 100). But the hymns addressed to him "are more ethical and devout in tone than any others. They form the most exalted portion of the Veda."[33]

The point of departure between the Avestan and the Vedic religion lies in the emphasis placed by Zarathushtra on ethical conduct to the exclusion of everything else. The supreme position in Zoroastrianism belongs to Ahura Mazda, the Lord Wisdom (Sanskrit Asura Medha). Ahura Mazda is the uncreated God, who creates all that is good. From Ahura Mazda emanate other beneficient divinities, some of whom are known by name to the Ṛgveda: Mitra and Apām Napāt. At the same time, Zarathushtra firmly and boldly rejected the worship of the warlike, materialistic Devas, that is Indra and his companions. Devas are amoral in

the Ṛgveda; they are branded wicked by Zarathushtra. Deva, Indra and Nāsatya figure in the Avesta also, but as demons. It is only Indra who is disowned, not the joint Indo-Iranian heritage. Vṛtrahana, the slayer of Vṛtra, is the personification of victory. In the Ṛgveda he is identified with Indra. In the Avesta he appears in his own right as Varathraghna. Also, there was a shift in the significance of fire. In the Ṛgveda, fire is a purifier; that is why dead bodies can be cremated. In Zoroastrianism, fire is pure; it is not to be polluted.

The institutions, customs and ways of thought of the Vedic and the Avestan people are so similar that there can be no doubt the two peoples are very closely related (chapter 8). Both call themselves Ārya, although in the Iranian context the term was reserved for the upper strata. (The name Iran itself is derived from Ārya.) Darius I describes himself in an inscription as "an Achaemenid (Hakhamanishya), Persian (Parsa), son of a Persian, an Ārya of Aryan descent". Any statement that is made about the history of the Vedic people should not only be consistent with the Vedic texts but also with the Avesta.

INDO-EUROPEAN FAMILY OF LANGUAGES

The ancient Indo-Iranian language does not stand in isolation. A comparative study of the grammar, syntax and vocabulary reveals the existence of a bigger, Indo-Eurpoean family of languages (chapter 8). This family can be divided into ten major branches, as discussed below.[34]

1. Indo-Iranian, already referred to, has the oldest history among the Indo-European languages. It comprises two main language groups: Indo-Aryan (or Indic) and Iranian. By common usage, the Vedic or the old Indo-Aryan language as well as classical Sanskrit are called Sanskrit. Middle Indo-Aryan, or Prakrit in the widest sense of the term, comprises three different stages of development: (a) Pālī is the language of the canonical literature of the Thera-vada school of Buddhism. At the same level of development are the various dialects recorded in Aśoka's (c. 250 BC) edicts. (b) Prakrit in the narrow sense of the term, or standard literary Prakrit, is found mainly in the drama and in the religious

writing of the Jainas. (c) Apabhraṃśa is known from the texts of the tenth century AD, but as a literary language it was formed some centuries earlier. It represents the final stage of middle Indo-Aryan, the one immediately preceding the modern Indic languages: Bengali, Hindi, Gujarati, Marathi and others.

A related language is Romani, spoken by the Gypsies of Europe. According to the eleventh-century Persian poet Firdausi, who collected many ancient legends and traditions of Iran in his *Shah-namah* (the book of kings), the fifth-century Sasanian king, Bahram Gur, invited 10,000 Indian musicians to his realm and gave them cattle, corn and asses so that they might settle in his realm and entertain people. The invitees however refused to settle down and wandered about the land "like wolves or wild dogs". Even if Firdausi's story is not wholly accurate, it is certain that the Gypsies eventually reached Europe from India, where probably the Doms constitute a related group.

Closely allied to the Indic group, but separated from it at an early epoch, are the Dardi and Kafiri (Nuristani) languages spoken in the Hindu Kush areas of Afghanistan and Pakistan.

The old-period Iranian is represented by documents in Avestan and old Persian. The middle Iranian is represented by middle Persian proper (Pahalvi) and by the east Iranian languages Sogdian and Saka (mainly in the dialect of Khotan). On the Indo-Iranian border, there are still many minor languages surviving in small pockets, for example, Pashto, the official language of Afghanistan, and Baluchi (or Balochi). In the north Caucasus, Ossetic still survives from one of the numerous Iranian invasions of south Russia. Apart from Persian, Kurdish also belongs to this group.

2. Balto-Slovanic, including Russian, Polish, Czech, Croatian, Bulgarian, Lithuanian and others.

3. Armenian, with the oldest texts dating from the fifth century AD.

4. Albanian, known since the fifteenth century AD.

These four languages are collectively known as satem-languages, because of the common way they treat the word for hundred (śatam in Sanskrit). Distinct from these are the centum-languages:

5. Greek, in which literature begins in about 600 BC with Homer, but probably the history of the language goes back another 500 years.

6. Latin, which has developed into various Romance languages (for instance French, Italian, Spanish, Portuguese, Rumanian.)

7. Celtic, consisting of Irish (Gaelic) and Brittanic (Welsh, Cornish, Breton). The continental Celtic or Gallic is extinct.

8. Germanic, which includes Nordic, English and German.

Discoveries made in the twentieth century have added two more names to the list:

9. Tocharian, the easternmost member of the Indo-European family, is now extinct. It is preserved in Buddhist manuscripts discovered in Chinese Turkestan and dating from the sixth to eighth centuries AD. Tocharian is divided into two dialects, A and B, which differ significantly in both vocabulary and grammar.

10. Hittite, which is preserved in cuneiform tablets recovered from Boghazkoi in east Turkey, the site of the capital Hattusha of the ancient Hittite kingdom. The cuneiform records cover the period c. 1700–1200 BC. Hittite is the oldest recorded Indo-European language.

The Indo-European languages are spread over a vast geographical area extending from Ireland in the west to India in the east. The linguistic distribution however is highly non-uniform. The European languages are confined to rather small areas and show marked differences from each other. In contrast, in ancient times vast stretches of land in Asia were inhabited by speakers of Indo-Iranian, a single member of the family.

A word about the nomenclature. Since all our information comes from linguistic sources, our terminology should also be linguistic. In particular, no racial conclusions should be drawn. The Ṛgvedic and Avestan people are called Aryan because that is how they described themselves in their texts. The term should be reserved for them alone, and not used as an umbrella term for Indo-Europeans. As we shall see (chapter 9), there were probably other contemporaneous Indo-Iranian speakers who were not associated with either the Ṛgveda or the Avesta. Even they should not be called Aryan. Finally, when it is necessary to distinguish between the two groups among the Indo-Iranians, the terms Indic speakers and Iranians may be used.

4

PURĀṆIC HISTORY

Do I contradict myself? Very well then I contradict myself (I am large, I contain multitudes).

A number of Purāṇas give king lists of various dynasties.[1] All Purāṇas do not cover all the dynasties. Even for a given dynasty, no list is complete in itself. Generally, when a dynasty went into decline, its kings were not named. There are some well established synchronisms involving kings of different dynasties. Various lists can be critically collated to arrive at a composite list for each dynasty. Our aim is to use these king lists for the limited purpose of establishing a very rough relative chronology of the political leadership in ancient times.

PURĀṆIC GENEALOGIES

The Purāṇas trace all genealogies back to Manu Vaivasvat. Manu had 10 children of whom two are particularly important: the son Ikṣvāku and the only daughter Ilā. Ikṣvāku, being the eldest son, is entitled to the family name. He is therefore the founder of the Sūryavaṃśa, the solar line. While Ikṣvāku can be considered a historical figure, Ilā still belongs to the twilight zone. According to one version, Ilā was born a man but became a woman because of a curse. Ilā married Budha (Mercury), son of Candra (moon), and got a son Purūravas who thus is the founder of the Candravaṃśa, the lunar line[2] (table 6). Note the astronomical connection at the founder's level.

There is a clue of uncertain chronological significance. Vedic texts as well as the Purāṇas tell the story of Pṛthu, son of Vena, who is said to have persuaded the earth to yield edible plants and fruits. Consequently, the earth was named Pṛthvi after him. The legend obviously commemorates the transition of the Aryans from hunting and food gathering to food growing. It is not

TABLE 6: Genealogical network of the Purāṇas up to the Bhārata battle

DN[1]	Vivasvat (sun)			Candra (moon)
	1. Manu	Yama	Yami	
2. Ikṣvāku				2. Ilā m. Budha (Mercury)
3. Vikukṣi[2]				3. Purūravas
6. Prthu				6. Yayāti
33. Hariścandra				7. Puru[3]
41. Sagar				43. Bharata
62. Raghu				51. Hastin[4]
65. Rāma				71. Kuru
94. Bṛhadbala				94. Pāṇḍavas

[1] DN, the dynastic number, counts the number of generations starting with the mythical progenitor Manu.

[2] Vikukṣi's brother Nimi led to the Videha or Janaka line.

[3] Yayāti's other sons were Yadu, Turvasu, Druhyu and Anu.

[4] Kings such as Divodāsa, Sṛñjaya and Sudās, who figure prominently in the Ṛgveda, belong to a secondary branch descending from Hastin. They are called Pāñcāla kings by the Purāṇas.

possible to date this epoch because Pṛthu Vainya, though mentioned in the Ṛgveda, is a semi-mythical figure. It is however clear from the Purāṇic references that this Pṛthu does not belong to any post-Manu Vaivasvata king list but is placed in an unspecified earlier period. This proves, if proof is necessary, that agriculture is older than royalty.

Some details are available about Manu Vaivasvata. He is the half-brother of the twins Yama and Yamī. Yama is the king of the deceased. He also figures in the Avesta as Yima, son of Vivahvant. There, he is the founder of civilization, who on instructions from Ahura Mazda makes his creatures prosperous. It is obvious that Manu is a mythical character, meant to bestow divinity on the ruling dynasties. Ambiguity about Ilā's gender and the pretension of divine paternity of her son point towards the same direction. The Ṛgveda refers to Purūravas as Aila, descendent of Ilā. It is probable that the story about Ilā was made out of the epithet.

It is reasonable to suppose that the original historical tradition was purely down to earth. The integration of some historical dynasties into a single network under divine auspices came later,

when these dynasties became important. Significantly, only two of Manu's 10 offsprings are given divine connection; the remaining eight are left alone. Either they were not powerful or were outside the catchment area of the Purāṇas. Thus, it is said that the descendents of Manu's son Dhṛṣṭa occupied Bālhīka (Balkh) and Nariṣyanta's offsprings were the Śākas. In passing, we may note that 114 of Ikṣvāku's grandsons are said to have been kings south of Mount Meru, as against 15 who ruled north of Meru.

It is important to examine in some detail the origin of the various branches of the lunar line because of their later importance. Purūravas was followed by Ayu, Nahuṣa and Yayāti. Yayāti had five sons: Yadu and Turvasu (from Devayānī) and Druhyu, Anu and Puru (from Śarmiṣṭhā). These five are the founders of the dynasties and clans named after them. Yadu's descendents are known as Yādavas, with the Haihayas as a branch. The most celebrated Yādava is Kṛṣṇa, who was Yadu's 87th descendent. A 21st descendent of Druhyu is the king Gāndhāra after whom the district and town are named. Gāndhāra's descendents are said to have spread out into the mleccha (impure) countries to the north and settled there. Anu's descendents were known as the Ānavas; they included Kekayas as a branch. The Turvasu line subsequently merged with the Purus.

From the Ṛgvedic as well as Purāṇic point of view, the most important dynasty is Puru's. His 37th descendent is the celebrated King Bharata, son of Duṣyanta. Seven generations later came Hastin after whom Hastināpura is named. After him, the main line went into decline and a secondary branch known as the Pāñcālas came into prominence. Several Pāñcāla kings figure in the Ṛgveda: for example Divodāsa, Sṛñjaya and Sudās, although the term Pāñcāla itself is not known to the Ṛgveda. The main line's fortunes were restored by Kuru who preceded the Bhārata battle by 22 generations. It was customary for various clans to refer to themselves by the names of their celebrated ancestors. Thus both Kurus and Pāñcālas are entitled to be called Purus and Bharatas after their common ancestors, as they are in the Ṛgveda.

Coming now to the progeny of Ikṣvāku. We are told that he had two sons, Vikukṣi and Nimi. The younger son Nimi, also known as Videha, founded the Videha dynasty. His grandson was Mithi Janaka. The city and the kingdom of Mithilā were named

after him. His second name was used as a family name by later kings. Much confusion has arisen by assuming various Janakas to be a single person. The main Ikṣvāku line was continued by Vikukṣi and includes many names that figure prominently in the Purāṇas. In decreasing order of seniority, they are Pṛthu, Māndhātṛ, Hariścandra, Sagar, Raghu and finally Rāma, who is 63rd in line from Ikṣvāku. After Rāma, the dynasty went into decline. Tradition associates the Ikṣvākus with the river Sarayu and the Bharatas with the Sarasvatī.

The Purāṇas provide some interesting insights. Sītā belongs to the Videha dynasty; her father is a Janaka, with the personal name Sīradhvaja. Both the names are associated with agriculture; Sīra means plough, while Sītā means furrow. Sītā and Rāma are cousins 61 times removed. This may explain the Jain and the Buddhist tradition of regarding the two as brother and sister. Significantly, like Rāma, Gautama Buddha is also a descendent of Ikṣvāku. This fact may have played a role in the development of Rāma's story in the post-Buddhist period. Kekayi is not from Sūryavaṃśa. Her name itself is an epithet; she belongs to the Kekaya branch of Candravaṃśa. That is probably why her son's name is the same as that of the famous Puru king. Thus her insistence on her son succeeding Daśaratha may have a more impersonal, clannish reason as well. In general, the endogamy rules implicit in the marriage alliances in the epics conform to the Purāṇic network of clans, thus underlining its credibility.

Purāṇic genealogies are most unselfconscious. They regard both Rāma and Kṛṣṇa as historical figures. Rāma's descendent Bṛhadbala fought in the Mahābhārata battle on the side of the villainous Kauravas and was killed by Abhimanyu. Apparently Bṛhadbala did not know that he was the descendent of an avatāra (Rāma) and was fighting against another (Kṛṣṇa). Rāma's story (Rāmopākhyāna) is introduced in the Mahābhārata in a matter-of-fact way (chapter 3). Yudhiṣṭhira while suffering exile in forest wants to know whether there was any man more unfortunate than him. In answer, Mārkaṇḍeya narrates Rāma's story, presenting him as an exemplary but nevertheless human figure.[3]

How dependable is the genealogical information provided by the Purāṇas? There is no way of checking the veracity of various king lists in their entirety. We can only check them vis-à-vis the

fragmentary historical references preserved in the Vedic texts. At no place does the Purāṇic tradition run counter to the Vedic allusions. In fact, the Purāṇas help place the Vedic references in their proper context, because very often in the Vedic texts patronyms are used in place of names for reasons of metre. The Ṛgveda remembers Yayāti as an ancient sacrificer and refers to him as Nahuṣya (son of Nahuṣa). The Purāṇas confirm that he is indeed an early king and son of Nahuṣa. Many kings, known from the Purāṇas to be early kings, figure in the Ṛgveda as mere names: Ikṣvāku, Purūravas, Māndhātṛ, and others.

Then there are kings who are prominent in the Purāṇas but do not figure in the Ṛgveda: Hariścandra, Bhagīratha, Arjuna Kārtavīrya, and others. However, Hariścandra appears in Aitareya Brāhmaṇa and Sāṇkhāyana Śrautasūtra, whereas Bhagīratha is mentioned in the Jaiminīya Upaniṣad Brāhmaṇa. The Purāṇas, thus, constitute a historical data bank consistent with the Vedas. The Purāṇas do not seem to have been overwhelmed by citations in the Ṛgveda. Many kings who are celebrated in the Ṛgveda are not known to the Purāṇas at all; examples are Abhyāvartin Cāyamāna, Śrutarvan Ārkṣa and Svanaya Bhāvya. These were probably minor chieftains who had the good fortune of having acquired the services of poetical ṛṣis. Remarkably, no contemporaneous hymn exists in honour of the most celebrated of kings, Bharata! If the Purāṇic history were concocted, it would have eulogized all the kings mentioned in the Ṛgveda.

More important than the names of the individual kings are the names of the various clans that figure in the Ṛgveda. The Vedic texts by themselves cannot establish the interrelationship between them. For example, *Vedic Index* can only suggest as probable that the Bharatas, in the times of the Brāhmaṇas, were merging with the Kuru-Pāñcāla people, or tentatively mention the possibility of the union of Bharatas and Purus with the Kurus.[4] A student of the Purāṇas would consider these conclusions as self-evident. The Purus, Bharatas, Kurus and the so-called Pāñcālas are all related clans, which used different names at different times to distinguish themselves from one another or from outsiders.

The Purāṇas reckon time not in years but in generations. According to them, there are 63 generations from Ikṣvāku to Rāma, and another 30 from Rāma to the Bhārata battle. If history

is to be extracted from such statements, an absolute date must be assigned to the Bhārata battle and time-spans must be expressed in years.

How many years make a generation? No firm numbers are available, but the Vedic texts do provide some clues. Ṛv (1.117.7) mentions an unmarried girl Ghoṣa "living in her father's dwelling, stricken in years" who finally got a husband. Ṛv (1.123.11; 7.2.5) refer to decorated maidens displaying their charms with a view to attracting suitors. There is mention of a lover visiting his beloved (Ṛv 7.55.5–8) and of consummation of marriage after the ceremony (Ṛv 10.85.29). It is thus certain that in the Ṛgvedic times, girls were married long after they reached puberty. Earlier sūtra texts confirm this.

The later Gṛhya and Dharmasūtras however prescribe that the bride be nagnikā (literally, "naked"), that is at the pre-pubertal stage.[5] It therefore seems reasonable to conclude that marriage, and consequently fatherhood, occurred at a comparatively older age in the Ṛgvedic period than in the later period. Bhīṣma who fought in the Bhārata battle along with Abhimanyu was a contemporary of Abhimanyu's great-great-grandfather. This points towards early parenthood. More specifically, when Abhimanyu died at the age of 16, his wife was expecting Parīkṣit. We shall therefore as a rule of thumb set a generation equal to 16 years for the post-Ṛgvedic period and raise the figure to 18 for the Ṛgvedic period itself.

THE BHĀRATA BATTLE

The Bhārata battle was a benchmark in the Purāṇic history. It was fought by the claimants to the heritage of the famed Puru-Bharata-Kuru line. The opposing sides were led by the (victorious) Pāṇḍavas and the villainous Kauravas. Kauravas and Pāṇḍavas were not related by ties of blood, just as among the Pāṇḍavas themselves the two youngest brothers Nakula and Sahadeva (sons of Mādri) were not related by blood to their elder brothers Yudhiṣṭhira, Bhīma and Arjuna (sons of Kuntī). The battle was not for territory, because land was not in short supply then, but for settling the perplexing question of legitimacy. The family feud escalated into a civil war in which all the tribes and

clans took sides. This shows that a general principle of great significance must have been involved.

The Puru-Bharata-Kuru dynasty, in a long span of 91 generations, from Purūravas to Vicitravīrya, displays but one discontinuity: Bharata was succeeded not by any of his own sons but by the son (Vitatha) of his adopted son Bharadvāja. After Vicitravīrya, however, there were two discontinuities one after the other, causing great turmoil.

Vicitravīrya died issueless, necessitating recourse to the practice of niyoga. Literally meaning "appointed task or duty", the term niyoga, probably implied in Ṛv (10.40.2), was used in the technical sense of "the appointment of a wife or widow to procreate a son from intercourse with an appointed male". Even in ancient literature there is great divergence of views about the origin, purpose and details of the niyoga practice. The following norms, however, were common: *(i)* the husband, whether living or dead, must have no son; *(ii)* the gurus in a family council should decide to appoint the widow to raise an issue for the husband; and *(iii)* the man appointed must be the husband's brother, or alternatively his sapiṇḍa or sagotra.

The term sapiṇḍa is unknown to the Vedic Saṃhitās as well as the Brāhmaṇas and Āraṇyakas. It appears for the first time in the Sūtra literature. The Dharmaśāstra works define sapiṇḍa as blood relations up to the seventh degree on the father's side and fifth on the mother's (Manusmṛti 5.60). The term gotra occurs several times in the Ṛgveda, in the sense of "herd". Later literature uses the term to mean an ancestral family from which its members traced descent. Members belonging to the same gotra were called sagotra. The man appointed to beget sons for the deceased was called a niyogin, or a bījin ("one who sows the seed"). The widow was considered a kṣetra ("field") of the deceased, so that the son so begotten was termed kṣetraja, "born in the field".[6]

On Vicitravīrya's death, the appointement was first offered to his paternal half-brother Devavrata, better known as Bhīṣma, and on his refusal, to the maternal half-brother Ved Vyāsa. Ved Vyāsa fathered Dhṛtarāṣṭra and Pāṇḍu from two queens, and Vidura from a maid servant. Since Dhṛtarāṣṭra was blind, the crown went to his younger brother Pāṇḍu, who however was unable to beget children of his own. That is where the problem began.

According to the prevailing norms, Dhṛtarāṣṭra should have been commissioned as the bījin. (In that case, probably his son from Pāṇḍu's wife would have become the king rather than his son from his own wife.) Pāṇḍu however chose to retire to the forest with his two queens and returned with five sons of anonymous paternity, ingeniously attributed to divinities.

Dhṛtarāṣṭra's eldest son Duryodhana ("invincible") refused to accept the Pāṇḍava claim to the throne, on the ground that their birth was not according to the norms. Duryodhana's argument must have struck a chord in the minds of a large fraction of the political and religious leadership. That is why the Kauravas could muster larger support than the Pāṇḍavas when it came to war and why elder statesmen like Bhīṣma and Vidura, though unhappy at the personal conduct of the senior Kauravas and sympathetic to the Pāṇḍavas, remained in the court. If Duryodhana were accepted as the king, then the Pāṇḍavas would have automatically been reduced to the status of low-born, with the result that the public humiliation of the Pāṇḍava queen Draupadi at the hands of Duśśāsana ("ungovernable") would not have raised protests, as would have been the case if she were recognized as a clanswoman. The term Pāṇḍava must have been coined either by a sympathizer of the Pāṇḍavas or after the result of the battle became known. This is because once they were designated Pāṇḍavas, they automatically became entitled to their father's throne. Since their rivals were the sons of the elder brother (Dhṛtarāṣṭra), they were known by the name of the common ancestor, Kuru. Both the terms Kaurava and Pāṇḍava became redundant after the battle.

The bloodshed seems to have been a part of the transition that the Indo-Aryans had to make from the autonomous Ṛgvedic nomadism to settled life which entailed assimilation of native cultural and ethnic elements. The Bhārata battle thus brings the Ṛgvedic age to a close in the real sense of the word. It is said to mark the beginning of the Kaliyuga, "the Kali age". Since the yuga system figures not only in the Purāṇas but also in the Vedic literature as well as in astronomical texts, it needs closer examination.

THE YUGA SYSTEM

The Ṛgveda uses yuga in the sense of a time-span, an age, or a generation. Ṛv (1.158.6) uses the expression daśame yuge (tenth

yuga) to refer to the age of Dīrghatamas; the yuga here seems to mean a period of 10 years or less, depending on how old an aged (jujurvan) person is expected to have been in those days. Vedāṅga Jyotiṣa refers to a five-year yuga. Atharvaveda mentions in order 100 years, ayuta (10,000 years) and then two, three or four yugas. This suggests that a yuga here means an ayuta. (The annual celebration of Yugādi (Ugadi) in South India implies a one-year yuga.)

The terms Kali, Dvāpara, Tretā and Kṛta are mentioned in the Vedic literature as the designation of throws of dice (akṣa) marked 4, 3, 2 and 1. Aitareya Brāhmaṇa mentions these terms. It is however not clear whether the dice were meant or the ages. Four ages Puṣya, Dvāpara, Khara and Kṛta are mentioned in the later portions of Ṣaḍviṃśa Brāhmaṇa, and the Dvāpara in the Gopatha Brāhmaṇa.

Yāska's Nirukta defines Brahma's day as equal to 1,000 yugas, without saying what a yuga is. During Brahma's day, the creation, maintenance and destruction of the universe are said to take place. Brahma's day is followed by his night of the same duration, during which he sleeps. The period day plus night is called Brahma's ahorātra. To get an idea of the actual years involved in these units, we must turn to Manusmṛti (1.68–86) which describes the yuga system in detail. The system is based on scaling the terrestrial phenomena to divine proportions by making suitable assumptions.

The Ṛgveda uses a year or (saṃvatsara) of 360 days. Taittirīya Brāhmaṇa sets this year equal to a day of the gods. A divine year of 360 divine days is used as a building block for the yuga system. Manusmṛti defines a unit of time called mahāyuga or caturyuga, comprising four yugas—Kṛta, Tretā, Dvāpara and Kali, with lengths in the ratio 4:3:2:1. The Kaliyuga, which is the shortest, consists of a core period of 1,000 divine years preceded and followed by a transition period of 100 divine years each, so that a Kaliyuga has in all 1,200 divine years (or $1,200 \times 360 = 432,000$ human years). The mahāyuga then contains $1,200 \times (4 + 3 + 2 + 1)$ or 12,000 divine years which equal 4,320,000 human years.

Still bigger units are constructed. A Manvantara or Manu for short ("Manu's interval") is defined as equal to 71 mahāyugas.

Next, a Brahma's day is defined as the sum total of *(i)* an introductory dawn equal to a Kṛtayuga, and *(ii)* 14 Manvantaras, each one of which is followed by a twilight period also equal to a Kṛtayuga. The purpose of this rigmarole is to arrive at the neat round figure of 1,000 mahāyugas for the length of Brahma's day. Expectedly, Brahma's life runs parallel to the human. His day and night are equal; 720 days or nights make a year of Brahma whose lifespan is 100 such years. Brahma is said to have completed exactly 50 years of his life at the start of his current day.[7]

This scheme is repeated in the Mahābhārata and Purāṇas. It was later appropriated by the Siddhāntic astronomers for expressing the planetary orbital periods. Thus Sūrya Siddhānta would say that there were 146,568 revolutions of Saturn in a mahāyuga, implying an orbital period of 29.4743 years. In the astronomical texts, Brahma's day is given the non-denominational designation kalpa.

The yuga nomenclature was adopted by the Purāṇic historians also, who divided the historical period into four ages. The Purāṇas thus generally say that the most sacred region in the Kṛtayuga was Naimiṣa forest, in the Tretā it was Puṣkara, in the Dvāpara Kurukṣetra, and in the Kaliyuga the Gaṅgā.[8]

The blame for mixing up the Purāṇic and the astronomical yugas rests squarely on the celebrated astronomer-mathematician Āryabhaṭa (b. AD 476). He introduced two changes in the traditional yuga system. He defined a kalpa as a period of 1,008 mahāyugas (instead of 1,000). Since 1,008 is divisible by seven, each new kalpa would begin on the same week day. Secondly, he divided a mahāyuga into four equal rather than unequal parts so that each consisted of 108,000 years. Āryabhaṭa started his astronomical Kaliyuga at 6 A.M. on Friday, 18 February 3102 BC (Julian) at Lanka, which is hypothetically placed at the intersection of the equator with the meridian of Ujjain. In astronomical parlance, this choice of epoch defines the Āryapakṣa, "the Ārya school" of Siddhāntic astronomy.

Āryabhaṭa also propounded another system, in which the Kaliyuga began six hours earlier, that is on the midnight of 17/18 February 3102 BC (Julian) at Ujjain. This is known as the ardharātrikapakṣa, "the midnight school". Since planets move, their configuration cannot be the same at midnight and at sunrise. In

particular, the sun and moon cannot remain aligned at two points in time, six hours apart. It is thus clear that Āryabhaṭa's Kaliyuga is a theoretical artefact, and not the epoch of an actual astronomical observation.[9]

How did Āryabhaṭa arrive at this particular date? It seems that his starting point was the observed planetary positions at a known epoch. Since he knew the orbital periods, he could calculate backwards the epoch when all the planets could be taken to have been aligned at the beginning of the zodiacal sign Aries (Meṣa). It is now known that planetary orbits are subject to various kinds of perturbations, and a theory depending on the orbital period as the sole parameter cannot give accurate results. According to modern numerical simulations, on 17/18 February 3102 BC the five geocentric planets were not aligned but spread over two neighbouring zodiacal signs. This again underlines the inference that the significance of the date was hypothetical rather than real. Even if Āryabhaṭa had chosen a slightly different epoch, it would not have made much difference as far as the actual sky conditions are concerned.

The choice of 3102 BC, however, had a special significance for Āryabhaṭa. Midday at Ujjain on the equinoctial day 21 March AD 499 exactly corresponds to the beginning of the year 3600 of his Kaliyuga. Since the ardharātrikapakṣa starts its Kaliyuga six hours before the Āryapakṣa, Āryabhaṭa artificially made the duration of the year slightly longer in the former case so that in both the schools the 3600th year starts at the same time. We may recall that AD 499 is the year of the composition of Āryabhaṭīya.

Unfortunately, while talking of the passage of time, Āryabhaṭa did not explicitly say "before the Kaliyuga". Instead, he used the term Bhāratāt pūrvam, that is "before [the] Bhārata [battle]", obviously alluding to the Purāṇic yuga system.[10] This is what gave currency to 3102 BC as the date of the battle. The use of Āryabhaṭa's epoch in the Purāṇic context is ironical in the light of the fact that he was severely castigated by his student critic Brahmagupta (b. AD 598) for deviating from smṛti ("tradition") while formulating his own yuga system.

The date 3102 BC for the Purāṇic Kaliyuga is not tenable. First, the Purāṇic and astronomical yugas are widely different in length. The Purāṇas divide 94 generations from Manu to the Bhārata

battle into three yugas, so that each yuga is approximately 31 generations or say 600 years. Āryabhaṭa's yugas, on the other hand, run into hundreds of thousands of years.

Secondly, an astronomical epoch begins at a precise moment which is chosen by the astronomer. In contrast to the astronomical Kaliyuga, the beginning of the Purāṇic Kaliyuga is not precise at all. According to Mahābhārata Ādiparvan (2.13), the battle occurred at the junction of Kali and Dvāpara. The Bhāgavata Purāṇa, on the other hand, gives two versions of the epoch. In one version (1.15.36), Kaliyuga started the day Kṛṣṇa died, while the second version (12.2.33) starts Kaliyuga at the very moment Kṛṣṇa died.[11] One can see the feeling of discomfort here. It did not look quite the right thing to have Kṛṣṇa live into the Kaliyuga. (According to the chronology of the Mahābhārata, Kṛṣṇa dies some 20 years after the battle.[12] This was the time when Yudhiṣṭhira abdicated in favour of his grand-nephew Parīkṣit.) We thus see that the Purāṇic Kaliyuga is a manner of speaking rather than a carefully chosen point of time as in astronomy.

Finally, if the Bhārata battle indeed took place in 3102 BC, how was the epoch recorded? (It could not have been in terms of eras that began later.) How and by whom was the date kept alive for 3600 years? How did Āryabhaṭa come across this date? If Āryabhaṭa's predecessers had been asked about the battle's chronology, what date would they have mentioned in answer?

DATE OF THE BHĀRATA BATTLE

The Purāṇas do not recognize Āryabhaṭa's date at all. They provide their own information on the subject. It is possible to calculate the Bhārata battle's date from statements within the Purāṇas. Unfortunately, one can derive not one but many dates. The Purāṇas contain a bland statement that 1,015 (or 1,050) years elapsed between Parīkṣit's birth (shortly after the battle) and the coronation of Mahāpadma Nanda.[13] Nanda's coronation was a singular event from the Purāṇic point of view because he was a son of a Śūdra mother, and exterminated all blue-blooded Kṣatriyas.

The Jain Pariśiṣṭaparvan calls Nanda the son of a courtesan by a barber. The Greek historian Quintus Curtius also says that Nanda was a barber who being handsome gained the affection of

the queen. Through her influence he obtained a position of royal confidence which he treachrously used to murder the king.

The Matsya Purāṇa assigns 88 years to the reign of the first Nanda. The figure is unreasonably high; 88 (aṣṭāśiti) appears to be a mistake for 28 (aṣṭāviṃśati), which the Vāyu Purāṇa quotes. The first Nanda was succeeded by his eight sons who, all Purāṇas agree, ruled for 12 years, giving a total of 40 years for the Nanda rule. (Ancient Sri Lankan chronicles reduce the figure to 22 years.)[14] A hoard of coins discovered from the Bhir mound at Taxila in 1924 contains 1,059 punch-marked coins from Magadha. These coins belong to three successive dynasties: Śiśunāga, Nanda and the Maurya. Significantly, while one can distinguish between coins issued by different kings in the case of the Śiśunāgas and the Mauryas, the Nanda coins all belong to a single ruler.[15] This is consistent with the brevity of the Nanda rule.

The Nandas were dethroned by Candragupta Maurya whose date of coronation is known from independent sources to be about 320 BC. Thus the Purāṇas themselves suggest about 1400 BC for the Bhārata battle. This date depends upon the veracity of the 1,015 (or 1,050)-year span between Parīkṣit and Nanda. It is not clear how this figure was arrived at. It is straightaway contradicted by other numbers given in the Purāṇas, as can be seen with reference to the Magadha dynasty. From the Bhārata battle to the coronation of Nanda, there ruled in Magadha 22 Bārhadrathas, five Pradyotas and 10 Śiśunāgas. (The Śiśunāgas were overthrown by Nanda.) The number of years are given for each of these kings, but often more than one figure is quoted for the same king. If we take the lowest in each case the period comes out to be 938 years. With the highest of the figures we get 1,498 years. This implies that each king ruled for a period ranging from 25 to 40 years.[16] These two numbers would then place the Bhārata battle in c. 1350 BC or c. 1900 BC. It seems that the Purāṇas cannot be trusted when they quote numbers. This is not surprising. In an oral tradition, it is easier to remember names than numbers. Also, an error in a name can be subsequently corrected but not in a number. Furthermore, one suspects that a king was assumed to be a ruler right from his birth (or adulthood) till his death. Thus the quoted number per king is more likely to be a measure of his lifespan or at least adult life rather than his reign.

For the period prior to the Bhārata battle we have depended on the king lists. To be consistent, we will depend on the lists for the post-Bhārata period as well. Pargiter has carried out an actual head count of the post-Mahābhārata kings which can be used to fix the date of the battle. By some curious logic, after the Bhārata battle, the Purāṇas chose to mention kings in future tense as if their reigns were being foretold. This sham separation of the past from the future took place in the reign of the Kuru king Adhisīmakṛṣṇa, who came five generations after the Pāṇḍavas. The Purāṇas say that from this initial point to the coronation of Mahāpadma Nanda, there reigned 26 Kuru kings. During the same period, there were in different parts of the country 24 Ikṣvākus, 27 Pāñcālas, 24 Kāśīs, 28 Haihayas, 32 Kaliṅgas, 25 Aśmakas, 28 Maithilas, 23 Surasenas and 20 Vītihotras.[17] In other words, there were in all 257 kings in 10 kingdoms, or an average of 26 kings in each.

We thus have a total of 26 plus 5 or 31 generations from the Bhārata battle through Adhisīmakṛṣṇa to Mahāpadma Nanda. This corresponds to a period of $31 \times 16 = 496$ years. Assigning the Nandas a total of 40 years, as suggested by the Vāyu Purāṇa, and placing Candragupta Maurya at c. 320 BC, we arrive at $496 + 40 + 320 = 856$ BC as an estimate for the Bhārata battle.

The Ikṣvāku list of the Purāṇas can be used to independently arrive at a date for the battle. According to the Purāṇas, there were 23 kings after Bṛhadbala, who was killed in the battle, up to Gautama Buddha. The list names Śākya, Śuddhodana, Siddhārtha (Buddha) and Rāhula in that order, followed by Prasenajit. This enumeration is obviously wrong. Prasenajit was Buddha's contemporary and the Buddha himself never ruled. The list was obviously doctored to incorporate Buddha and his family. Let us however assume that the modification was carried out by deleting four names from the original list and replacing them with names from Buddha's family. In other words, we assume that though the names may be wrong, the number of generations is substantially correct. Assigning each king 16 years as before, we arrive at a span of 368 years before the so-called Buddha's reign. If we take Buddha's date of birth to be about 560 BC as is usually done, the Bhārata battle would be placed at about 928 BC[18] (figure 1).

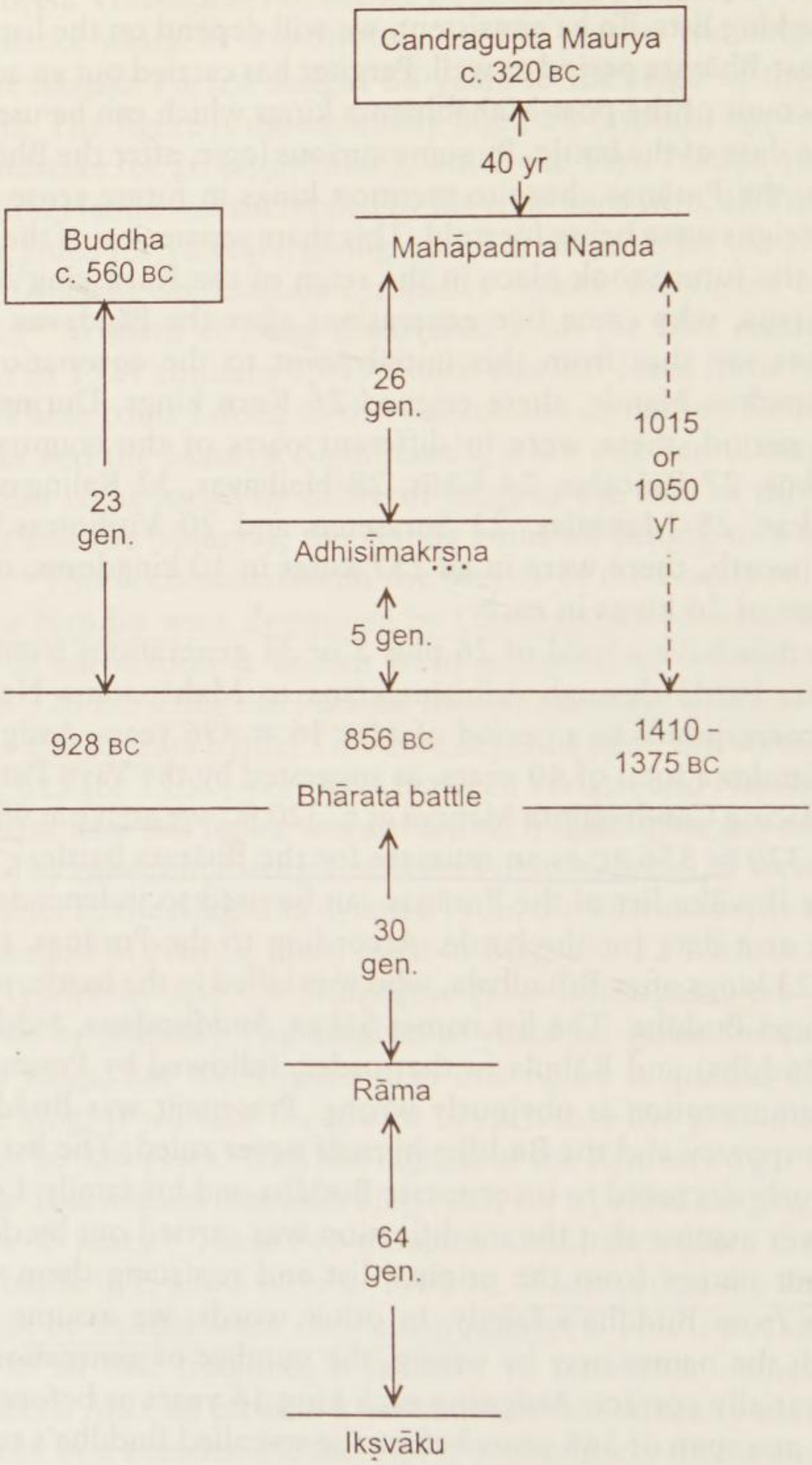


FIG. 1. Chronology according to the Purāṇas, with one post-Bhārata battle generation set equal to 16 years

The method we have used to arrive at an absolute date consists of two steps: *(i)* choose a historical date from outside the Purāṇas; *(ii)* convert the qualitative statements in the Purāṇas into numbers by making a reasonable assumption. There are two major sources of error in this method. We do not know how reliable the assigned number of generations is. Nor do we know how justified we are in equating one generation with 16 or 18 years. Also, the derived date for the battle depends on the veracity of the historical date chosen as the starting point. While the date of Candragupta's accession is generally accepted, there is some controversy about Buddha's date of birth. It has recently been suggested that Buddha be placed at c. 400 BC on archaeological grounds. Keeping these uncertainties in mind, we can say, in round numbers, that the battle took place in about 900 BC. This then would also be the Purāṇic date for the final compilation of the Ṛgveda. It is comforting to note that this date is quite close to the date of 1000 BC that has been arrived at for the Ṛgveda from an entirely different route, that is, a comparison of the structure of the Ṛgvedic language with that of the later texts.

Astronomical clues

Attempts have been made to ascertain the date of the Bhārata battle from the 150-odd astronomical references in the Mahābhārata text.[19] It is a well-established fact that the text of the Mahābhārata was composed over an extended period of time. Over and above this, there are passages which are clearly recognized as later interpolations. Of the 150 astronomical verses, it is not possible to single out those verses which are contemporaneous with the battle.

Many of the astronomical-sounding statements in the Mahābhārata occur in the pre-war and wartime commentaries narrated to the old King Dhṛtarāṣṭra, who being blind could not see things for himself. Dhṛtarāṣṭra was not a detached observer of the war. He was commonly perceived as having brought on the war by turning a blind eye to his sons' excesses. To convey to him the awesomeness of the impending disaster, the narrators used the device of an "eye-witness" account that purported to "show" how even the cosmic order had been violated by the war.

When the sage Vyāsa calls on Dhṛtarāṣṭra before the war in a last-minute effort to avoid the war, he ominously says, "Lotuses and water lilies are blossoming on the trees" (Bhīṣmaparvan 3.10). The terrestrial turmoil is matched by the cosmic: "With the fierce sun, moon and all stars shining all the time, I am unable to distinguish day from night" (Bhīṣmaparvan 2.22); "Saturn is harassing Rohiṇī [Aldebaran]. The spot on the moon has vanished" (Bhīṣmaparvan 2.32); "Rāhu has seized the moon.... A very deadly comet has overcome Puṣya" (Bhīṣmaparvan 3.11–12).

The official narrator, Sañjaya, describing the sky conditions on the eve of the war to Dhṛtarāṣṭra, notes, "The seven great planets further assembled in the sky at one place, inflamed" (Bhīṣmaparvan 17.2). "... a big meteor dashed eastwards against the rising sun with a big bang, and then shattered with great noise" (Bhīṣmaparvan 19.38). The same imagery is reused on the ninth day of the war: "Huge burning meteors struck the sun, and precipitately rebounded on the earth, foreboding imminent alarm" (Bhīṣmaparvan 95.51).

Meteors and eclipses resurface in the description of the confrontation between two powerful adversaries Bhīma and Duryodhana: "Meteors ... pelted the earth in hundreds with thunder, almost exploding the dome of the sky.... Rāhu swallowed the sun most prematurely" (Śalyaparvan 55.9–10). Further, it is stated that while Arjuna was combating the Saindhava king, "Rāhu eclipsed the sun and the moon simultaneously. Meteors, scattering all around, struck the sun" (Aśvamedhaparvan 76.15–16).

Similarly, while conveying the news of the Kaurava commander Karṇa's death to Dhṛtarāṣṭra, the narrator adds a cosmic touch: "... rivers ceased to flow; the sun became devoid of lustre and disappeared; and Saturn, son of Yama, going obliquely, appeared on the horizon red bright like the sun" (Karṇaparvan 68.47). "Jupiter began to vex Rohiṇī, and became lustrous like the moon and the sun.... people lost sense of direction; sky was filled with darkness; earth shivered; fiery meteors hit the earth; and goblins roaming in the night rejoiced" (Karṇaparvan 68.49–50).

Interestingly, a similar word picture is painted to describe events that would have taken place much before the Mahābhārata time. When Tretā yuga ended and Dvāpara began, "Indra did not send rains, Jupiter was retrograde, and the moon abandoning his own orbit, receded towards south" (Śāntiparvan 139.13–15).

Although these and similar passages do not provide any clues to the problem at hand, namely the date of the Bhārata battle, they tell us, in an inverted manner, the state of astronomical knowledge at the time of their composition. It is very likely that these passages were added to the story much later for dramatic effect and show.

In Bhīṣmaparvan (13.42–43), we have the incongruous spectacle of Sañjaya educating Dhṛtarāṣṭra on the diameter and circumference of the sun and moon. These details, interesting as they may be in their own right, are unlikely to have held the attention of the old king during the war days. We, however, do obtain a clue of some significance. In these passages, the well-known geometrical constant (circumference divided by diameter), commonly denoted by the Greek letter pi, is set equal to three. This rather inexact value figures in the Śulvasūtras.[20] (The more exact value, 22/7, came into use much later.) We thus have circumstantial evidence pointing towards additions being made to the Bhārata story in the sūtra period (say 500 BC).

Vyāsa's pre-war monologue with Dhṛtarāṣṭra, tells us that a lunar eclipse took place on the Kārtika full moon (Sabhāparvan 79.19) and a solar eclipse on the following new moon (Bhīṣmaparvan 2.23). We are also told that the two were separated by a pakṣa ("half-month") of only 13 days (Bhīṣmaparvan 3.32). Now, a 13-day pakṣa is in principle possible, but can be discerned only by calculation and not actual observation. It is thus likely that these references were added as an afterthought. We, however, do learn in passing that the composers of these late passages were capable of calculating the true positions of the sun and moon, and they realized that a 13-day pakṣa as well as two eclipses within a fortnight were a rarity.

We know from back calculations that total solar eclipses would have been visible from northwest and north India on 4 October 955 BC and 4 July 857 BC.[21] One wonders whether the memory of an actual eclipse close to the epoch of the Bhārata battle gave rise to the widespread use of the eclipse imagery in the description of the battle.

We can estimate a time bracket for the closure of the Mahābhārata text from the following considerations. The Mahābhārata mentions Yavanas (Greeks); it must therefore have been

open in the Indo-Greek period.[22] It however does not mention the zodiacal signs or week days, said to be introduced into India through contact with the Bactrian Greeks. The earliest representation of the zodiacal signs appears to be on the railing pillars at Baudha Gayā, dated c. 100 BC.[23] The earliest reference to week days appears to be by an astronomer Garga cited by Varāhamihira in his Bṛhat Saṃhitā (AD 505). Garga is also placed at c. 100 BC.[24] Thus the Mahābhārata text must have been closed some time before 100 BC.

The Mahābhārata contains genuine astronomical observations, also, but they need not necessarily belong to the epoch of the battle. Aśvamedhaparvan (44.2) states that a winter solstice took place in the asterism Śravaṇa. Calculations show that this happened in c. 450 BC, that is much after the battle. It is reassuring that the date is consistent with the pre-Alexandrian, sūtra chronology indicated above. There is however one description which obviously belongs to the epoch of the battle. It is said that Bhīṣma died on the winter solstice day (Śāntiparvan 47.2–3). By itself this statement cannot be dated. A later passage (47.64) adds that this happened on the eighth tithi of the bright half of the lunar month of Maghā. The problem with this additional information is that the passage has been declared to be an interpolation and is therefore unreliable. Taken as a mathematical exercise at face value, this implies that Bhīṣma's death could have occurred any time between 2300 BC and 200 BC! The spread is large but the older limit is interesting: it is younger than the oft-quoted date of 3102 BC for the battle, by 800 years.

Astronomical data in the Mahābhārata have been interpreted by a number of scholars to yield a wide spectrum of dates ranging from 3140 BC to 1151 BC.[25] A 2,000-year spread in the time bracket shows that the astronomical dating of the literary texts on the basis of stray statements in them is a highly dubious exercise. This bracket is no improvement on the dates assigned otherwise. It is however significant that no one has ever suggested for the Bhārata battle a date very much younger than 900 BC.

To sum up, we have made an attempt to extract some historical data from the Purāṇas. We have confined our dependence on the Purāṇas to the extent of assuming their king lists to be by and large reliable as far as the number of generations is concerned. In

particular, we have not depended on the numbers quoted or on the territorial claims. Deducing a rough date of 900 BC for the Bhārata battle and assigning 18 years per generation for the pre-battle period, we can attempt a reconstruction of the Purāṇic history. In round numbers, we can place Kṛṣṇa (and the Pāṇḍavas) at 900 BC, Rāma at 1450 BC and Ikṣvāku at 2600 BC (see table 6 and figure 1). It is noteworthy that when we accept 900 BC as the date for the Bhārata battle, the Purāṇas fall in line with the evidence from other, more reliable sources such as the Vedic texts and archaeology.

5

ARCHAEOLOGICAL SETTING

History records the names of royal bastards, but cannot tell us the origin of wheat.

—Jean Henri Fabre

The prehistory of the Indian subcontinent (or India for short) began at Mehrgarh in Baluchistan in about 7000 BC with the transition from hunting, food gathering and nomadism to agriculture, animal husbandry and village life. The first crops to be domesticated were the winter cereal grasses, wheat and barley, which require cold wet conditions after germination. These conditions are met in a vast area that extends from the Mediterranean coast in the west through the Zagros Mountains to the Indus and beyond in the east, and from the Red Sea in the south to east Turkey in the north. This area receives moisture in winter from the westerlies off the Mediterranean, the moisture coming as rain in the plains and snow in the mountains. Accordingly, the whole region took to farming more or less simultaneously. Well-known early farming sites in the region include Catal Huyuk in east Turkey; Jericho in Palestine; Ali Kosh in the Iranian lowlands of Khuzistan which is a part of the Mesopotamian plains; and since the 1970s Mehrgarh.[1]

The advent of agriculture in the neolithic (new stone) age was a revolution in the true sense of the word. Men and women now needed a much smaller piece of land than before to sustain themselves. The land in turn needed a much smaller labour force to work on it. There was a surplus of humanpower and food, especially after the introduction of irrigation and, later, double cropping. These surpluses led to the development of new technologies, brisk external trade, and the establishment of non-agricultural cities and towns. For a long time it was assumed that the spectacular city civilization of Harappa and Mohenjodaro that flourished during c. 2500–2000 BC was an incidental by-product of the developments in west Asia. The discovery of Mehrgarh has

proved this assumption to be untenable. Archaeological evidence shows that the twin cities were the culmination of developments within the subcontinent itself.

METHODOLOGY

When a modern field archaeologist comes across an ancient site that needs to be explored, he or she chooses a small area and digs vertically down until the natural soil is reached, below which no human habitation is possible. Human occupation of a site results in accumulation of material of various kinds, which in course of time becomes debris for the next phase of settlement. An archaeologist's task is to identify strata or layers in a site which represent successive phases of occupation. Thus the occupation history of a site is broken into periods I, II, III, and so on, with I usually denoting the deepest and the oldest. If needed, the periods are divided into sub-periods: Ia, Ib, Ic, Id. This periodization defines a site's relative chronology. Artefacts (mostly pottery fragments) from different sites are then intercompared to define a material culture or a cultural phase, often named after one of the sites.

The next step is to try to establish an absolute chronology. Towards this end, suitable samples are collected from well-defined strata and taken to the laboratory where they are assigned absolute dates using techniques of calibrated radiocarbon dating or thermoluminescence. Strictly speaking, the laboratory date is applicable only to the specific sample. But, by extrapolation it is applied to the whole assemblage. The extrapolation however can be problematic. Although each date in itself is accurate, very often a large number of samples from the same layer yield widely differing dates. One must then "select" a date as representative of the whole assemblage, keeping in mind the stratigraphy of the site and synchronism with other sites. Now archaeologists also collect samples from artificially defined layers and analyse them statistically.

A culture is characterized by a number of technological landmarks: farming, handmade and wheel-made pottery, artificial irrigation, double cropping, and working of various metals. Archaeological artefacts have a technological aspect and a stylistic

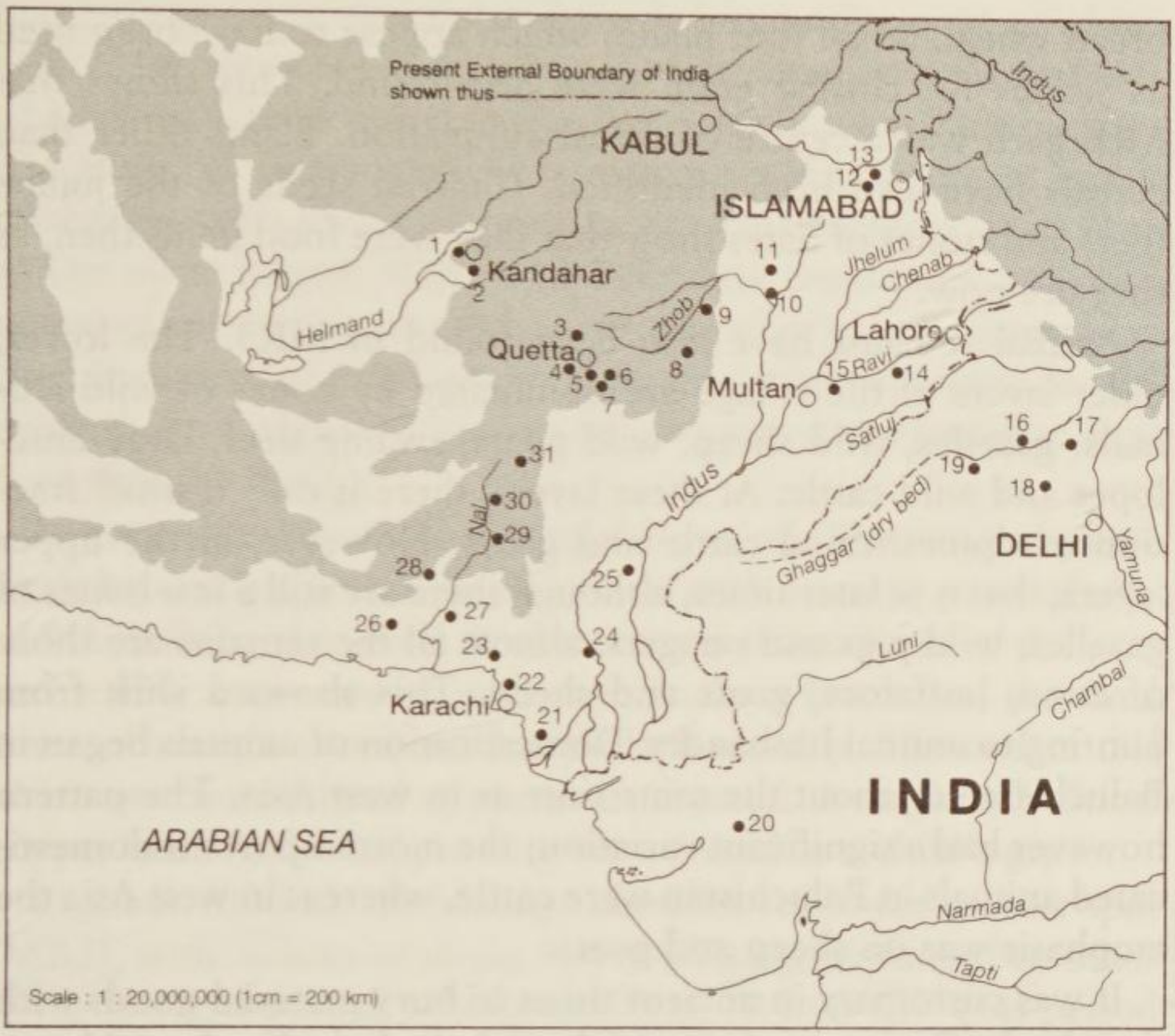
aspect. In the case of pottery, for example, the use of the turning wheel, quality of the paste, and the firing temperature and techniques constitute the technological aspect, whereas the shape and colour of the pots and the motifs on them constitute style. Technological aspects change slowly while style can be changed easily. Thus, in general, technology is a signature of the times whereas the pottery style represents the personality of a culture. Occasionally, the arrival of a new cultural element is accompanied by the introduction of a new technology. But very often the new arrival manifests itself as a change in style, while inheriting the technological infrastructure of the predecessors.

MEHRGARH

Mehrgarh[2] is situated about 250 km northwest of Mohenjodaro in the Kachi plain between Indus and the Baluchistan hills. It lies at the foot of the Bolan Pass on River Bolan, a tributary of the Indus. Thus, although the area is administratively a part of Baluchistan, it belongs to the Indus drainage system. The Bolan Pass has been a landgate to India since great antiquity. The other famous pass, Khyber, further north, cuts through the lofty Hindu Kush and seems to have come into general use later. Mehrgarh is located on the historical route that connects the fertile Indus Valley, via Quetta and Kandahar, to the Iranian Plateau, which in turn leads one to central and west Asia (see map 1).

Thanks to the rich alluvium and floodwaters, Mehrgarh was eminently suitable for ushering in farming. The Mehrgarh site consists of six mounds spread over an area of about 200 hectares, one hectare (100 m × 100 m) being approximately 2.5 acres. After a settlement was completely or partially abandoned, the inhabitants set up residence a little distance away, so that the mounds now contain remains of inhabitation that continued uninterrupted for more than 4,500 years, till about 2300 BC.[3]

At the beginning of this century, the Bolan River shifted its course to the west and started flowing in a new channel, a few kilometres away from the old one. In the process it cut through the oldest mound, called MR3, spread over an area of several hectares. The cliff-like exposure produced by the new channel revealed, buried beneath the alluvial layers, a 10 m thick deposit



1	Mundigak	9	Periano Ghundai	17	Rakhigarhi	25	Kot Diji
2	Said Qala	10	Gumla	18	Mitathal	26	Kulli
3	Kili Gul Muhammad	11	Rahman Dheri	19	Kalibangan	27	Nindowari
4	Damb Sadaat	12	Jhang	20	Surkotada	28	Mehi
5	Kechi Beg	13	Sarai Kala	21	Allahdino	29	Nal
6	Mehrgarh	14	Harappa	22	Tharro	30	Anjira
7	Faiz Muhammad	15	Jalilpur	23	Balakot		
8	Rana Ghundai	16	Banawali	24	Amri		

MAP 1. Sites belonging to the Baluchistan and early Harappan phases (after Shaffer and Thapar 1992, map 8)

consisting of successive layers of archaeological remains. This mound is a result of occupation from c. 7000 to c. 4700 BC (Period I). This period is broken into two sub-periods: Period IA (c. 7000–5000 BC) and period IB (c. 5000–4700 BC). The mound revealed a farming village of the neolithic age which was yet not familiar with pottery. The village consisted of rectangular houses made of mudbricks and containing many rooms. The houses were separated from each other; the intervening open space was used as a burial ground.

The most important find is of various cereal grains: two-row hulled barley, six-row barley, einkorn wheat, emmer wheat and

bread wheat. Small flint blades which appear to have been used as sickles for cutting grain were also found. This shows that Mehrgarh was a centre of cereal cultivation. Plants other than cereals have also been identified. Charred seeds of the jujube (ber) and stones of dates show that they were food items then, as they are now.

Animal remains have also been found in MR3. The lower, older layers of the village are dominated by bones of wild animals: gazelles, wild sheep, wild goats, swamp deer, large antelopes and wild cattle. At these layers, there is only a small fraction of domesticated cattle and goats. However, in the upper layers, that is at later times, although there are still a few bones of gazelles, wild pigs and onagers, almost all the remains are those of cows, buffaloes, goats and sheep. This shows a shift from hunting to animal husbandry. Domestication of animals began in Baluchistan at about the same time as in west Asia. The pattern however had a significant variation; the most important domesticated animals in Baluchistan were cattle, whereas in west Asia the emphasis was on sheep and goat.

It was customary in ancient times to bury material goods with the dead. Grave goods at Mehrgarh include bead necklaces, anklets and belts. The beads were made out of bone and various local stones. In addition, imported materials was also used: turquoise which must have been imported, shells which must have come from the sea coast 600 km away, and lapis lazuli which must have come from Afghanistan. It is therefore obvious that there existed a network of long-distance trade, though it is not clear how the imported goods were paid for.

All this information has come from the top levels of the oldest mound (MR3). A deep sounding that went right down to the natural soil revealed the same type of grains: wheat and barley.

In about 4700 BC, mound MR3 was more or less abandoned and the Mehrgarhians moved a few hundred metres away, as if to commemorate their transition from the neolithic age to the chalcolithic (copper plus stone). The second mound (MR4) contains remains of the period c. 4500–4000 BC (Period II)—segmented into Period IIA (c. 4700–4300 BC) and Period IIB (c. 4300–4000 BC). During this phase, the population increased and the village became bigger and more complex. Several square mudbrick

buildings were constructed and divided into cells, some of which had a floor area of even less than 1 m². In these cells, impressions of grain have been found as also flint-stone sickles. This suggests that these cells were used for storing grain. An important find is the cotton seeds, clearly suggesting cotton cultivation for its fibre and/or oil-rich seed. High incidence of six-row barley and cultivation of cotton suggests that some type of irrigation system may have been present. (Before this find, the earliest evidence for the cultivation of cotton in the region was found at Harappan sites later than 2400 BC.)

Pottery makes its debut during this period. The first pots were made by coating both sides of baskets with a coarse paste of clay and then firing the vessel at a low temperature. Some of the pots had earlier been coated with asphalt. In a few cases, the final external surface was coated with dark red slip. The end of this phase saw the nominal appearance of metal. A single cylindrical copper bead and a copper ring were found in a child's grave.

In about 4000 BC, the Mehrgarhians moved to yet another spot (MR2), with an area of about 900 m². The third mound contains remains of the period c. 3900–3500 BC (Period III). This period was marked by significant developments. Pottery was now made from a finer paste, was fired at a higher temperature, and most importantly was now wheel made and mass-produced. A large number of workshops have been found. Here lapis lazuli, turquoise and carnelian were worked into beads with cylindrical drills made of green jasper and rotated by means of bows. There were advances on the agricultural front also. Two new varieties of bread wheat were cultivated and an entirely new cereal, oat, was grown. The increase in food production is reflected in an increase in the size of the settlement which now covered about 50 hectares.

At Mehrgarh, several fragments of crucibles have been found. Traces of copper ore still adhere to these fragments. Obviously these crucibles were used to melt copper. It appears certain that copper metallurgy reached (Afghanistan and) Baluchistan in a fully developed form from east Iran. Tal-e Iblis in the copper-rich Kuhrud Mountain provides evidence for the sequence of developmental stages in copper technology as early as fifth millen-

nium BC. (Unlike copper, iron technology was indigenously developed in India in about 1000 BC.)

In about 3500 BC the settlement at Mehrgarh again shifted to occupy the final spot (MR1). Period IV (c. 3500–3200 BC) produced buildings that contain large storage jars. The potters mass-produced plain wares in a variety of shapes and thicknesses. Goblets were made as thin as an eggshell. The production of female figurines also continued; as before, they are in a seated position. Their appearance however is more naturalistic and they are made out of terracotta. Significantly, stamp seals made of terracotta and bone made their appearance. Period V (c. 3200–3000 BC) marks the large-scale interaction with settlements to the west.

The period from about 3000 to 2800 BC (Period VI) saw Mehrgarh enjoying its prosperity. Wine grape was added to the agricultural inventory. Pottery and figurines were produced on a massive scale. More than 200 jars of various sizes, belonging to c. 2900 BC, have been found stacked in rows or placed one inside the other. Probably, a sudden flare-up during firing led to the process becoming faulty, and the potters simply left the defective pots where they stood.

The figurines made during the last period, VII (c. 2800–2300 BC), are no longer seated but standing upright. A slight arching of the hips to the side in female figures, which appears regularly in later Indian art, appears here for the first time. Male figures now appear in sizeable numbers, accounting for 30 per cent of the total. The Mehrgarh site was abandoned some time around 2300 BC. Period VIII (c. 2300–2000(?) BC) is evidenced at the cemetery to the south of MR1 at Sibri, 8 km away. It is marked by the appearance of new cultural elements (chapter 9.) The eight cultural periods at the Mehrgarh site are listed in table 7.

During the more than four millennia of its existence, Mehrgarh saw its tradition spread (map 1). In about 4800 BC or even earlier, a settlement came up at Kili Gul Muhammad, in the fertile Quetta Valley, near the Zargheen Mountains. The site is barely 3 km from Quetta city. Its earliest levels belong to the pre-pottery neolithic era. It was soon followed by chalcolithic settlements at Rana Ghundai and at other places in Baluchistan. The tradition continued to flourish till about 1800 BC at Nausharo,

TABLE 7: Chronology of Mehrgarh

Period	*Assigned time bracket*	*Mound*
IA	7000–5000 BC	MR3
IB	5000–4700 BC	MR3
IIA	4700–4300 BC	MR4
IIB	4300–4000 BC	MR4
III	4000–3500 BC	MR2
IV	3500–3200 BC	MR1
V	3200–3000 BC	MR1
VI	3000–2800 BC	MR1
VII	2700–2300 BC	MR1
VIII	2300–2000(?) BC	

located about 5 km southwest of Mehrgarh, even after Mehrgarh itself ceased to exist. Thus, the Baluchistan tradition which came into existence in about 7000 BC continued until about 1800 BC.

In about 4000 BC, settlements appeared south of the Hindu Kush in the Helmand basin. The oldest site, Mundigak, is situated in a mountainous region about 55 km northwest of modern Kandahar (map 1). Mundigak lies on the now dry bed of a tributary of the Arghandab, which itself is a tributary of the Helmand. Another major site is Shahr-e Sokhta in the Iranian Seistan. (Seistan is a small area divided between Iran and Afghanistan.) Mundigak was founded in about 4000 BC as a small agricultural village. In the course of the next millennium (Periods I–III), it developed into a major urban centre (Period IV). The urban phase (c. 3000–2000 BC) was characterized by interaction with central Asia and Iran as well as with the Baluchistan tradition, as can be seen from the similarity in ceramics. The nearby small sites of Said Qala Tepe and Deh Morasi Ghundai were settled during Mundigak's urban phase. In the Iranian Seistan to the west, Shahr-e Sokhta, like Mundigak, made a transition from a village (Period I–II) to an urban centre (Period III). In about 2000 BC there occurred a discontinuity: Said Qala and Deh Morasi were abandoned forever, Shahr-e Sokhta (Period IV) reverted to a village, while Mundigak entered a period that bore no resemblance to the earlier periods. The new phase lasted until the Iron Age when Mundigak was finally abandoned.

GREATER INDUS VALLEY CIVILIZATION

The Baluchistan tradition remained a loose confederation of regional phases in contrast to the Harappan tradition proper in which the regional phases were integrated into a single (mature Harappan) cultural phase. Also, Baluchistan shows closer ties with sites across the Hindu Kush than across the Indus. The mature Harappan phase is used as a benchmark for the entire archaeological sequence. Various phases in this sequence are designated pre-Harappan (or preferably early Harappan), mature Harappan and late Harappan. We may use the term Greater Indus Valley tradition to denote the totality of the Baluchistan and the Harappan traditions.[4]

The earliest site known so far in the Harappan sequence is Balakot, on the Makran coast, northwest of the modern city of Karachi (see map 2). It has been assigned a time bracket of c. 4000–3500 BC by radiocarbon dating. There is thus a gap of about three millennia between the beginnings of Mehrgarh and Balakot. Balakot appears on the scene in an already well-developed form and shows some degree of cultural affinity with the Baluchistan tradition. It is reasonable to consider Mehrgarh as the starting point for the Harappan tradition also, and await the uncovering of sites that would fill the gap between Mehrgarh and Balakot.[5]

Even more important than Balakot is Amri on the west bank of Indus at a point where the hills of Baluchistan are closest to the river. It is situated on the alluvial plain but above the flood line. Amrī came into existence in about 3500 BC and remained occupied till about 1400 BC. Its significance lies in the fact that it is a single site displaying all the Harappan phases. Amrī-type material has been identified at 29 sites in the area. After about 3300 BC there was a general increase in settlements. A notable site from this period is Jalilpur, on the Ravi, in Multan. The still later sites are better known: Kot Diji, 180 km northeast of Amri, on the east bank of lower Indus; the early layers at Harappa on the east bank of the now dry course of Ravi; and Kalibangan I on the Ghaggar (in Rajasthan).

Kot Diji-related material has been uncovered at 63 sites in Pakistan, 40 of which are located in Cholistan Desert in Bahawalpur, on the Hakra channel, that is the lower part of the Ghaggar.[6]

1 Sarai Kala	9 Mitathal	17 Sukkur	25 Chanhudaro
2 Manda	10 Kalibangan	18 Kot Diji	26 Balakot
3 Rupar	11 Harappa	19 Mohenjodaro	27 Allahdino
4 Bhagwanpura	12 Gumla	20 Lohamjodaro	28 Desalpur
5 Bara	13 Rahman Dheri	21 Nindowari	29 Surkotada
6 Hulas	14 Musa Khel	22 Kulli	30 Lothal
7 Banawali	15 Dabar Kot	23 Sutkagen Dor	31 Rangpur
8 Alamgirpur	16 Nausharo	24 Amri	32 Rojdi

MAP 2. Mature Harappan phase sites. Some of these also belong to the Harappan phase (after Dani and Thapar 1992, map 9).

On the basis of archaeological data from the lower Indus and lower Ghaggar, we can talk of four early, interconnected, evolutionary phases: Balakot phase (c. 4000–3000 BC), Amri phase (c. 3600–3300 BC), Hakra phase (c. 3300–2700 BC) and the Kot-Diji phase (c. 2800–2300 BC).[7] This civilization moved southwards into Kutch and Saurashtra in c. 2500 BC.

The epoch 2500 BC marks the beginning of the peak or the mature Harappan phase which saw the emergence of planned cities: Mohenjodaro, Harappa, Ganweriwala (in Bahawalpur), Rakhigarhi (in Hissar district, Haryana) and Dholavira (in Kutch), followed by the small but important town of Kalibangan II on upper

Ghaggar and the port town of Lothal in the Gulf of Cambay. This phase lasted until c. 2000 BC.

Historically, the eponymous site of Harappa was the first one to be explored. It was noticed by travelling British officials in 1826 and 1831, but more carefully examined by Maj. Gen. Alexander Cunningham in 1853 and 1856, who published the details in 1875.[8] The whole circuit of ruins was estimated to be nearly 4 km, with the highest mound standing at 18 m. It seems that atop the ruins existed a Buddhist monastry. It is said that a Raja named Har Pal built a city at the site (hence the name Harappa, or Harapa as Cunningham used it). According to folklore, the city was ruined by heavenly wrath on the Raja's debauchery culminating in incest. Later on, in Akbar's time, an Idgah is said to have been built at the site, unmindful of the ancient ruins lying underneath. Subsequently, the ruined brick mounds provided a handy source of bricks for construction work in the area, more so when railway lines were being laid. The mounds "more than sufficed to furnish brick ballast for about 100 miles of the Lahore and Multan Railway".[9]

Cunningham made several excavations at Harappa, "but the whole surface had been so completely cleared out by the Railway contractors that I found very little worth preserving." He discovered a number of stone implements and numerous specimens of ancient pottery. "The most curious object discovered at Harapa is a seal belonging to Major Clark, which was found along with two small objects like chesspawns, made of a dark brown jasper.... The seal is a smooth black stone without polish. On it is engraved very deeply a bull, without hump, looking to the right, with two stars under the neck. Above the bull there is an inscription in six characters, which are quite unknown to me. They are certainly not Indian letters ..."[10]

The continued vandalism at the site brought to the surface some ancient artefacts. In view of the reported antiquity of these mounds, the government ordered their excavation. Preliminary work was begun in January 1921 by (Rai Bahadur) Daya Ram Sahni. Major excavations were carried out between 1926 and 1934, which uncovered an ancient city. A short but scientific excavation in 1946 revealed the presence of an earlier cultural phase hidden beneath the city. Harappa is one of the few sites to

have a mature-period cemetery, called Cemetery R37. In addition there is another later-day cemetery (Cemetery H) which appears on the scene after a discontinuity, and implies the arrival of new cultural elements.[11]

A year after Harappa, excavation was taken up at Mohenjodaro in Sind. Mohenjodaro is situated 600 km southwest of Harappa on the west bank of the Indus (now some 5 km away). The site was topped by a Buddhist stupa belonging to the Kushana period of the second century AD. The stupa attracted a number of robbers who penetrated to the heart of the building in search of saleable relics. What remained of the stupa and the mound underneath was discovered in 1922 by Rakhal Das Banerji, the Bombay-based director of the western archaeological district.[12] Thus ironically, both Harappa and Mohenjodaro came to the notice of the archaeologists owing to the professional activity of robbers. (Archaeologists now have better methods of identifying ancient sites.)

Mohenjodaro was excavated between 1922 and 1931 and then again in 1947. Mohenjodaro is built on a brick platform to protect the city from floods in the Indus valley. Annual deposition of alluvial soil by floods has raised the land surface in this area. The water table has correspondingly risen; it is now at 45 m above mean sea level. The result is that archaeologists have not been able to reach the lower levels. We have thus no idea how the city originated. The site has continuously been eaten into by mineral salts, especially sodium sulphate. Excavation work at Mohenjodaro has been forbidden since 1964 to protect (under UNESCO auspices) what remains of the site.[13]

The discovery of the twin cities of Harappa and Mohenjodaro was no doubt spectacular and the resulting excitement understandable. But the fact remains that the methodology employed was faulty. During the winter of 1924–25, several hundred workers were ordered to dig the whole of Mohenjodaro as though a field was being ploughed. The different sub-areas at Mohenjodaro are still known by the names of the archaeologists placed in charge of the diggings: HR for H. Hargreaves, VS for M. S. Vats, DK for K. N. Dikshit, SD for A. D. Siddiqui, and DM for B. M. Dhama.[14] In the process, stratigraphical clues to the evolution of the settlement at the site were lost forever.

The missing top of Harappa, the unreachable bottom of Mohenjodaro and the general mix-up in the middle make it imperative that one turns to other sites to construct the archaeological history of the Harappan tradition.

In 1946, only 37 Harappan sites were known; the number now could be as large as 2,500.[15] The Greater Indus Valley civilization was spread over an area of more than a million square kilometres, though not at the same time. The westernmost site is Sutkagen Dor on the Iran-Baluchistan border. The easternmost site is Alamgirpur on the banks of the Yamuna's tributary, the Hindan, 45 km northeast of Delhi. The northern outpost was Manda, on the right bank of the Chenab in the foothills of the Pir Panjal Range, 28 km west of Jammu. Generally avoiding the Thar Desert, the Harappan expanse included Kutch and Saurashtra and extended up to the latitude of Bombay, as represented by Daimabad on the left bank of Pravara in the Ahmednagar district of Maharashtra.

A marine trading post has been identified at Ra's al-Junayz in Oman. Interestingly, a Harappan site has been uncovered beyond the Hindu Kush at Shortugai on the Amu Darya in north Afghanistan. It lies close to Badakshan, slightly to the west of the Pamirs, which is a rich source of lapis lazuli and minerals. Lapis lazuli is a bright blue, semi-precious stone (sodium aluminium silicate-sulphate) that was greatly coveted in the ancient world. Its mining involved hard work in difficult terrain. The rock was first heated by lighting a fire under it and then cooled suddenly. The cracked rock was then chipped off and sent to various markets through multiple exchange. It is surmised that Shortugai was a trading post for dealing in lapis lazuli and other minerals. The Harappan traders must have been supplying lapis lazuli to other centres, because the Harappan tradition itself did not have much use for it.[16]

The mature Harappan phase made extensive use of copper and, to a lesser degree, its alloy (with tin) bronze. While the Harappans could have obtained their copper from the Khetri mines in the Aravalis, where did they get the tin from? It does not seem to be widely known that the Tosham area in Bhiwani district, Harayana, 160 km north northwest of Delhi, contains abundant and easily accessible deposits of primary tin (as cassiterite) as well

as copper.[17] We would like to put forward the hypothesis that Tosham tin was used to make the Harappan bronze. In addition to copper and bronze, gold and silver were known and used. The whole phase shows an overall uniformity of a high order that extends to all walks of life: architecture, town planning, standardization of weights and measures, and even the arts and crafts but, interestingly, not rituals and beliefs. This large-scale uniformity bordering on monotony in the third millennium BC is no doubt unique but it has often been overstated. For example, female figurines in terracotta are very common in the mature Harappan sites in Sind but are absent in Rajasthan and Gujarat.[18]

Natural food patterns in northwest India and Gujarat were different. Northwest India received its food supply from the rabi (spring) cereals, wheat and barley, which require winter rains. On the other hand, Gujarat with its cool dry winters and hot wet summers produced the kharif crops of the monsoon: millets bajra, jowar and ragi. Saurashtra took to double cropping at the beginning of the mature phase, unlike northwest India where double cropping was not introduced until after the mature phase was over.[19]

The hallmark of the Harappan economy during the mature phase was the external, including maritime, trade. Evidence for this comes from Mesopotamia. Mesopotamian texts refer to objects imported from Meluhha, which has been identified with the coastal parts of the Harappan civilization. There are also references to the ports of Dilmun (probably Bahrain) and Magan (Oman). The first reference is in the time of Sargon of Agade (c. 2300 BC), but the references grow during the third dynasty of Ur (2130–2020 BC) and the subsequent Larsa dynasty (2020–1770 BC). The references show a marked decline after this.

It appears certain that Harappa's contact with Mesopotamia was indirect. Trade was not carried out through mutual visits by traders, but through ports like Dilmun (Bahrain) where traders from both sides arrived by boat and exchanged goods. The discovery of a Harappan trading port in Oman, the presence of a Persian Gulf seal at Lothal (which served as a dock), all point towards the use of intermediary ports for trade exchange.[20] It is also likely that overland trade was carried out via Tepe Yahya in east Iran, which lies midway between Mesopotamia and the Indus.

Mature Harappa shows cultural continuity with the preceding phase. This can be clearly seen in Amri, Kot Diji, Kalibangan and Dholavira where both pre-Harappan and mature Harappan phases are present. Metal and stone industries of mature Harappa were already in existence in pre-Harappa. Pre-Harappa used standardized bricks with dimensions in the ratio 1:2:3. The standardization was carried over to the next phase, even if the ratio was changed to 1:2:4. Pre-Harrappan pottery continues into the mature Harappan phase with the transitional layer clearly visible. Fortification of towns and construction of embankments are a pre-Harappan practice continued by the mature Harappans. The continuity is not surprising. Mature Harappa is the product of the same technological and ecological milieu as pre-Harappa's. The techniques for dealing with the perennial problem of floods would have been perfected over a long period of time and accepted as regional know-how. Mature Harappa does not change the paradigm, only enhances it. That is why in most cases, early Harappan is a more meaningful label than pre-Harappan.[21]

The pottery at the oldest early-Harappan sites Balakot and Amri carries painted and incised abstract marks which might have been the insignia of the potter or the owner. It has been speculated that in the course of time these marks evolved into the Harappan script,[22] which remains the most intriguing aspect of the Harappan civilization.

HARAPPAN SCRIPT

Inscriptions in the Harappan script appear on a number of objects: *(i)* The most common are the seals, generally made of steatite or soapstone on which texts are engraved in reverse. *(ii)* Then there are sealings which are positive impressions in relief on impressible material like clay, faience (decorated earthenware or porcelain) and metal. *(iii)* There are a number of other inscribed objects which, in decreasing order of frequency of occurrence, are miniature tablets of stone, terracotta or faience (at times shaped like a prism or a rectangular bar); copper tablets; pottery; ivory or bronze rods; and bronze implements. In addition, there are stray objects like fragments of bracelets, ivory plaques and dice, a terracotta ball and even a brick.[23] The most

spectacular specimen of Harappan inscription comes from Dholavira in Kutch. The inscription consists of a number of characters, about 37 cm high and 25–27 cm wide. Each character has been made by joining together carefully cut pieces of a cyrstalline material, rock, mineral or paste. It seems that these characters were engraved on a wooden board.[24]

A 1982 publication lists a total of 2,962 inscribed objects. (The exact numbers may undergo minor revisions.) Not surprisingly, a large fraction (85 per cent) comes from the twin cities of Mohenjodaro (1,540 objects) and Harappa (985), followed by Lothal (213), Kalibangan (99) and Chanhudaro (66). Another 15 sites have yielded 34 objects, while 25 seals and sealings have been found at 10 sites in Mesopotamia and elsewhere in west Asia. The Mesopotamian sites of Ur, Telloh, Kish, Till Asmer and Susa have yielded a small number of square stamp and cylindrical seals. Some of these are engraved with the Harappan script alone; on others, writing is combined with Harappan animal figures: unicorn, elephant and rhinoceros. Two Harappan stamp seals have been found at Altyn-depe in south Turkmenistan, one of which bears a two-sign inscription. It is not included in the above listing.[25]

The purpose of these seals outside the Harappan expanse is not clear. One wonders whether in west and central Asia they were collectors' items. The solitary clay sealing discovered at Umma in Mesopotamia suggests the arrival of freight marked with the sender's insignia, from the Harappan territory. A few round Indus seals (a type rarely found in the Indus Valley) have been discovered along with a large number of local round stamp seals on the islands of Bahrain and Failaka in Kuwait in the Persian Gulf.[26] The type-wise distribution of the inscribed objects is highly non-uniform. Mohenjodaro specializes in seals and is the sole yielder of copper tablets. Miniature tablets occur at Harappa and nowhere else. The bulk of pottery graffiti comes from Harappa and Kalibangan.[27]

The total number of distinct signs in the Harappan script is 419, much fewer than the Sumerian (about 600 signs), Egyptian (700) and Chinese (3,500). Most of the Harappan signs are formed by compounding or modifying simpler signs. Out of the 419 Harappan signs, 113 occur only once, 47 twice, and 59

fewer than five times, leaving 200 signs in general use. Significantly, about 35 of the Harappan signs can probably be recognized in proto-Elamite writing, as seen from clay tablets (c. 3600–2800 BC) found at Tepe Yahya. The Harappan inscriptions are very short. There are only eight texts longer than 15 signs. The longest inscription has 26 signs written on three sides of a prism. The longest continuous text has 17 signs in three consecutive lines. Some texts consist of only one or two signs. The average length of an inscription is five signs.[28] The most common symbol accompanying the inscription is a unicorn which appears 1,159 times, followed by a bull (156 times).[29]

The decipherment of the Harappan script is beset with a number of inherent problems. *(i)* It is an unknown script of an unknown language. *(ii)* The texts are very small. *(iii)* There are no clues to place or personal names. *(iv)* There are no bilingual texts available so far. Although a number of claims have been made on the decipherment of the script, none has found any considerable acceptability. One thing however is certain. The script was written from right to left. But when the text was carried over to the second line, the continuation started from the left.[30] The decipherment of the Harappan script eagerly awaits the appearance of a bilingual text somewhere or of a decipherer blessed with extraordinary insight.

Among other things, we can expect to learn about the group to which the language belongs. The limitations, however, need to be kept in mind. The Harappans, unlike the ancient Egyptians and Mesopotamians, have not left behind their political history in their inscriptions. In a certain sense, the Harappan culture wears a haunted look, where we can see the cities and the artefacts, but we know nothing of the people. The civilization's vastness, political and economic unity, homogeneity and conservatism all raise tantalizing questions which at the current level of knowledge cannot be fully answered.

LATE HARAPPAN PHASE

In about 2000 BC (or a little later) the mature phase came to an end. The central authority, that had most conscientiously enforced homogeneity over the vast expanse, collapsed. In addition, there

arrived new cultural elements. Many characteristic Harappan artefacts such as stamp seals, triangular cakes, miniature cart frames and wheels, perforated pottery, cubical weights, fired bricks and script characters disappeared. External trade came to an end; several settlements including urban centres were abandoned, and many new, smaller and poorer ones established, without regard to town planning or drainage. These localized subcentres became autonomous and developed their own characteristic pottery styles, retaining some of the old features. Accordingly, they are identified by local names. The late Harappan phase in Sind is known as the Jhukar phase, represented by sites like Jhukar itself, Amri, and more completely by Chanhudaro. In Gujarat, the late Harappan phase is known as the Rangpur phase, as seen at Rangpur II B–III, Lothal B, and Rojdi IB–II. The late Harappan phase in the area covered by Punjab, Haryana and their neighbourhood is called the Cemetery H phase, or the Punjab phase. It is known from the sites of Harappa Cemetery H, Mitathal, Bhagwanpura, Siswal, and others (chapter 9 and maps 2 and 13).[31]

A late Harappan site accidentally came to light in 1969 in Chandigarh when the ground was being dug in the city centre, Sector 17, for laying the foundations of a multi-storeyed building and for building an underground cycle and car park. The bulk of the archaeological finds was salvaged by an alert Punjab University team from the truckloads of earth being carted away from the construction site. The most important find from Chandigarh consisted of two potsherds with Harappan inscriptions.[32] This valuable site will perhaps be fully explored in the distant future when Chandigarh itself becomes an object of archaeological interest.

Significantly, no mature Harappan sites have so far been found in the valleys of Satluj and Beas, with the singular exception of Kotla Nihang Khan and Ropar on the left bank of Satluj in the Shivalik foothills. These sites were probably the centres for supplying forest wood to settlers lower down. During the late Harappan period, a few settlements did appear on the Satluj, but none in the plains. On the other hand, the more manageable, rainwater-fed Ghaggar river system hosted the whole range of early, mature, and late Harappan sites, with the Shivalik rivers

becoming particularly important in the late Harappan period.[33] We return to the late Harappan-phase cultures in chapter 9 where they are examined in the context of their co-founding cultures.

END OF HARAPPAN TRADITION

The various late Harappan cultures had a long, rather undistinguished innings that took them even beyond 1500 BC. Great cultures do not die, they simply fade away. Finally, the late Harappan cultures in north India were absorbed into a new culture, known as the Painted Grey Ware (PGW) culture. Thus came to an end a cultural continuum that had spanned more than five millennia and a vast area extending from the west of Indus to just short of the Ganga.

How did the Harappan civilization come to an end? The question was taken up soon after the discovery of Harappa and Mohenjodaro. In 1934 it was tentatively suggested by Vere Gordon Childe (1892–1957) that the Harappan cemetery H culture "may belong to the Aryan invaders".[34] The hypothesis was further developed in 1946 by Mortimer Wheeler who at least in the early stages propagated it with vigour.

For "proof" of his assertion, Wheeler turned to the Ṛgveda itself.

> The Aryan invasion of the Land of the Seven Rivers, the Punjab and its environs, constantly assumes the form of an onslaught upon the walled cities of the aborigines. For these cities the term used in the Rigveda is pur, meaning a 'rampart', 'fort' or 'stronghold'.... Indra, the Aryan war god, is puramdara, 'fort destroyer'.... In brief, 'he rends forts as age consumes a garment'. Where are or were these citadels? It has in the past been supposed that they were mythical, or were 'merely places of refuge against attack, ramparts of hardened earth with palisades and a ditch'. The recent excavations of Harappa may be thought to have changed the picture. Here we have a highly evolved civilization of essentially non-Aryan type now known to have employed massive fortifications, and known also to have dominated the river-system of north-western India at a time not distant from the

likely period of the earlier Aryan invasions of that region. What destroyed this firmly-settled civilization? Climatic, economic, political deterioration may have weakened it, but its ultimate extinction is more likely to have been completed by deliberate and large-scale destruction. It may be no mere chance that at a late period of Mohenjo-daro, men, women and children appear to have been massacred there.[35]

Although, for form's sake, Wheeler did add that "Digging, and more digging, will ultimately solve the problem",[36] he had no doubt that "on circumstantial evidence, Indra stands accused".[37] The first half of the twentieth century was dominated by wars and thoughts of war, present and past, real and imagined. The word Ārya was hijacked by the German Nazis and made into a dirty word. In such a milieu, Aryan invasion was a concept with a perverse appeal. It was widely accepted and the charge sheet against Indra expanded.

Damodar Dharmanand Kosambi argued in 1956 that the invading Aryans shattered the Harappan dam system, which ruined the agriculture of the region and therefore the cities also.[38] In support of this hypothesis, Kosambi cites Indra's epithet Vṛtrahana (killer of Vṛtra) quoted in the Ṛgveda, interpreting Vṛtra as obstacle or barrage. Kosambi's hypothesis ignores the well-attested fact that Vṛtrahana as a divinity personifying victory appears in the Avesta also, where Indra is explicitly called a demon. Obviously then, Vṛtrahana belongs to the period when the Avestan and Vedic people were together (chapter 3). This must have happened before the Vedic people could possibly have encountered the Harappans or their dams. It then follows that Indra could not have earned this particular title by his exploits against the Harappans.

The Ṛgveda contains numerous references to inimical people with whom the Ṛgvedic people fought over cattle and pasturage. These hostile people are mostly called Dāsas, Dasyus or Pāṇis. The term Dasyu figures in the Ṛgveda 85 times, Dāsa 64 times, and Pāṇi 44 times.[39] Their kings are named. The Ṛgvedic king Divodāsa was pitted against the Dāsa chief Śambara, who is mentioned about 20 times in the Ṛgveda. Divodāsa's son Sudās fought against fellow Aryans as well as the Dāsas. The Aryan king Ṛjiśvan, son of Vidathin, conquered Pipru whose name occurs 11

times. There are other Dāsas who are named: Cumuri Dhuni, Varcin, and others. That the hostilities against the enemies were an important aspect of the Ṛgvedic life is borne out by the Aryan royal name Trasadasyu, "one who makes the Dasyus tremble'.[40] The enemies of the Ṛgvedic people did not praise Indra, nor press Soma, nor sing hymns. They were called dark-skinned. At one place (Ṛv 5.29.10) they are called anāsaḥ, which has been segmented as a-nāsaḥ, meaning flat-nosed. This has been interpreted to mean that the Dasyus belonged to a different ethnic population. Some scholars would like to write anāsaḥ as an-āsaḥ, "mouthless", that is, not speaking the Aryan language.[41]

It is significant that the Dāsas counter-attacked the Ṛgvedic people who prayed for strength against their enemies (Ṛv 2.11.4, 4.28.4, 6.25.2). This suggests that the two sides were evenly matched. Since the Aryans attributed their victories to their gods Indra or Agni, it is likely that the strength of the enemy fortification was exaggerated in honour of the divinities. This and the requirements of metrical poetry may explain the expression "ninety nine puraḥ" of Śambara (Ṛv 4.24.3). Interestingly, when the Ṛgvedic poets prayed for their own defence, they asked for copper puraḥ (Ṛv 1. 58.8, 7.95.1), no doubt contrasting the strength of metal against the vulnerability of mud. The strength of the Aryans came from their use of the horse and chariot. The Dāsas and Pāṇis must also have been similarly equipped. Had the enemies of the Ṛgvedic people been "native" farmers, they probably would have been pedestrians and therefore in no position to awe the Aryans.

The Dāsas and Dasyus were known to the ancient Iranians as Dahae and the Pāṇis as Panas.[42] It is likely that the Dāsas captured in war were used as slaves, so that in the later language the term dāsa came to mean a slave in general.

The most solid argument against the hypothesis that the Ṛgvedic people destroyed the Harappan cities comes from the fact that the archaeological description of a Harappan city does not match the word picture of a pur as culled from the Vedic texts. In 1976 the German Sanskrit scholar Rau determined as exactly as possible the meaning of the term pur, its synonyms, and a few allied words in the Vedic literature.[43] Pur is etymologically related to the Greek word polis, "fortified city".

According to Rau, a pur had several characteristics: *(i)* It consisted of one or several concentric circular ramparts. *(ii)* It was built of mud or stone. *(iii)* The pur was fortified with combustible defences which were probably palisades, wattle or prickly shrubs. *(iv)* It was furnished with wooden sheds as quarters for human occupants. *(v)* It was stocked with provisions, water, and grass or fodder for cattle. *(vi)* It was not permanently occupied but served mainly as a refuge in times of danger. *(vii)* There is reference to autumnal puraḥ, meaning either old puraḥ or puraḥ built every autumn. *(viii)* A pur probably needed repairs after each rainy season.

A Harappan visiting a concentric circular pur described in the Ṛgveda is hardly likely to have felt at home. In return, there is not a word in the Vedic texts on the characteristics of Harappan cities: brick walls, brick houses, brick-paved streets laid out on a plan, granaries, baths, citadels and seals.[44] Archaeological evidence collected since Wheeler's time goes against the Aryan invasion hypothesis.

Skeletons from the late levels of Mohenjodaro included not only men but women and children as well. They were found in the lower town rather than the citadel where fighting would be expected to take place. No weapons have been discovered by their side.[45] It is hard to believe that when Mohenjodaro was being attacked by foreign invaders, only a handful of bare-handed men decided to fight it out in the lower town. And when they needed help, instead of enlisting help from other men these beleaguered men called in their women and children! Even if these killings were at the hands of invaders, they could not possibly have brought the whole "empire" down.

There are other far and near cities with signs of fortification: Kot Diji, Kalibangan, Surkotada, Dholavira and Rojdi.[46] None of these fortifications shows any sign of damage, nor have skeletons been found anywhere else in the Harappan expanse except at Mohenjodaro. Even if we assume for the sake of argument that Mohenjodaro fell to the invaders, it would not mean the surrender of the entire civilization. By this time, the central authority had already collapsed leading to the establishment of a number of localized cultures at a much lower level of attainment. At Mohenjodaro itself, exquisitely decorated pottery of the mature phase

gave way to crude plain pottery. Artistic seals of earlier times were replaced by simple functional ones with geometrical patterns. Signs of decline, impoverishment and collapse of administration were everywhere. Decaying buildings, partitioning of earlier bigger houses, use of old bricks in construction, encroachment on streets, all point towards the beginning of the end.

While there can be no doubt that the Ṛgveda does refer to attacks by the Vedic people on the non-Vedic, it is certain that the Harappan cities were not involved. Even if Indra stands accused, he cannot be prosecuted in a Harappan court.

The general opinion among scholars now is to ascribe the demise of the Harappan tradition to ecological factors, for instance, a prolonged spell of aridity (chapter 7). At the end of the mature phase when new elements appeared on the scene (and prior to the demise of the Harappan culture), the resultant culture was still a derivative of the Harappan. But when the Aryan entry took place, the late Harappans were culturally overwhelmed and absorbed into the new mainstream. They did contribute to its growth, but at the cost of losing their own identity. Probably, a fraction moved southwards, outside the initial Aryan zone of influence.

NON-HARAPPAN CULTURES

There were a number of copper-using village cultures which though outside the Harappan mainstream were not necessarily unrelated to it: the Ochre Coloured Pottery culture in the Satluj-Ganga Plain, the Banas culture in Mewar in southeast Rajasthan, and the Malwa culture in Madhya Pradesh.

Ochre Coloured Pottery (OCP) was first found at the lowest levels at Hastinapur. On rubbing, it left a pale brownish-yellow or ochreous colour on the fingers, hence the name. The worn-out condition of the pottery could have been due to defective manufacturing techniques such as poor firing. Alternatively or simultaneously, it could be due to external conditions like waterlogging because of floods. OCP is thus more of an umbrella term than a definitive cultural entity. In any case, the label has stuck to the pottery if not the colour.

Ochre Coloured Pottery from the region between the Satluj and Yamuna shows clear signs of Harappan affiliation as can be

seen from Bara on the Satluj itself, Mitathal and Siswal in Haryana, and Jodhpura in the Jaipur district of Rajasthan. Two sites in west Uttar Pradesh, Ambkheri and Bargaon in the upper part of the Yamuna-Ganga doab, also belong to the same type. (We may use the abbreviation Yaga to denote Yamuna-Ganga.) There is another type of OCP which apparently stands in a class of its own. It comes from the lower Yaga doab sites of Lal Qila (Bulandshahar district), Alamgirpur and Saipai (Etah district), as also from Bahadarabad (Saharanpur district). At Saipai, OCP is accompanied by a number of stray copper tools.

This is significant because elsewhere in the Yaga plain, copper tools have been found not in ones or twos but in isolated hoards, devoid of any signs of habitation. The copper hoards include barcelts, swords with antenna-type hilts, swords with hooks, harpoons and anthropomorphs. These tools seem to be characteristic of the Yaga plain, although a harpoon was found at Mitathal in the course of pre-excavation ploughing on the mound. A fragmentary piece of an unidentified object with a convex end and two broken side-lugs, from the Harappan levels at Lothal, has been compared rather half-heartedly with the anthropomorph. In the whole Harappan expanse, this is the only candidate for such an identification. Significantly, the large Harappan repertory of copper artefacts does not include an anthropomorphic figure. (Copper hoards have also been found in the Chota Nagpur Hills, Orissa and Deccan.) Copper hoards of a different type have been discovered from the west of the Yaga doab (chapter 9).

At many copper hoard sites in the Yaga plain, OCP has been found at a lower layer. It has been suggested that the pottery and the hoards are related. This may well be the case, but there are reasons to be sceptical. The copper tools show workmanship of a high order which is not seen in the pottery. Secondly, hoarding of tools at a site devoid of signs of habitation cannot be considered a usual practice. One wonders whether the copper hoards represent a ritualistic burial of copper tools on the advent of full-blown Iron Age. No dates are available for the copper hoards. Thermoluminescence dates for OCP span the bracket 2600–1100 BC. Jodhpura OCP has been assigned the calibrated radiocarbon bracket c. 2500–2300 BC.[47]

The Mewar region in east Rajasthan is hilly, copper rich and, thanks to Banas River and its tributaries, green. The Banas moving

northwards joins the Chambal which in turn joins the Yamuna. This region gave rise to the Banas culture, with Ahar near Udaipur as the type site. The 13 m thick deposit of ancient debris has been divided into periods IA, B and C, and assigned the total calibrated radiocarbon time bracket c. 2500–1400 BC. The period IA extends from c. 2500 to c. 2100 BC.[48] Ahar used no stone blades, only copper, though the technology was poorer than the Harappan. However, Gilund, barely 80 km away, had a developed stone-blade industry. Significantly, about seven main pottery types are associated with the Banas culture.[49] Perhaps by virtue of its central location, Mewar was open to influences and migrations from a variety of sources.

The newly discovered site of Balathal in Mewar, about 40 km northeast of Udaipur, shows a chalcolithic culture which flourished during c. 2500–1600 BC. It seems to have been in contact with the mature Harappan phase in Gujarat, from where it learnt to build spacious houses of stone and mudbricks. A notable feature is the presence of a fortification in the centre of the settlement. Since Balathal, like Ahar, is located in a copper-rich area, here also there is a general absence of stone blades.[50]

The Malwa region is a plateau drained by the Chambal and Betwa which join the Yamuna. It is bounded to the south by the Narmada. Malwa is exceptionally fertile due to its black soil, although the sticky soil would have been hard to plough with copper tools. Consequently, the chalcolithic people here confined themselves to the narrow alluvial strip of the rivers. Kayatha lies about 280 km southeast of Ahar. The oldest culture here belongs to the calibrated bracket c. 2450–2000 BC (Period I). The site was apparently abandoned for a while after Period I. Pottery from Period II (c. 1950–1700 BC) shows extremely close affiliation with the Banas culture. This was followed by Period III (c. 1700–1400 BC) which displays pottery well known from sites like Navdatoli and Inamgaon in central India.[51]

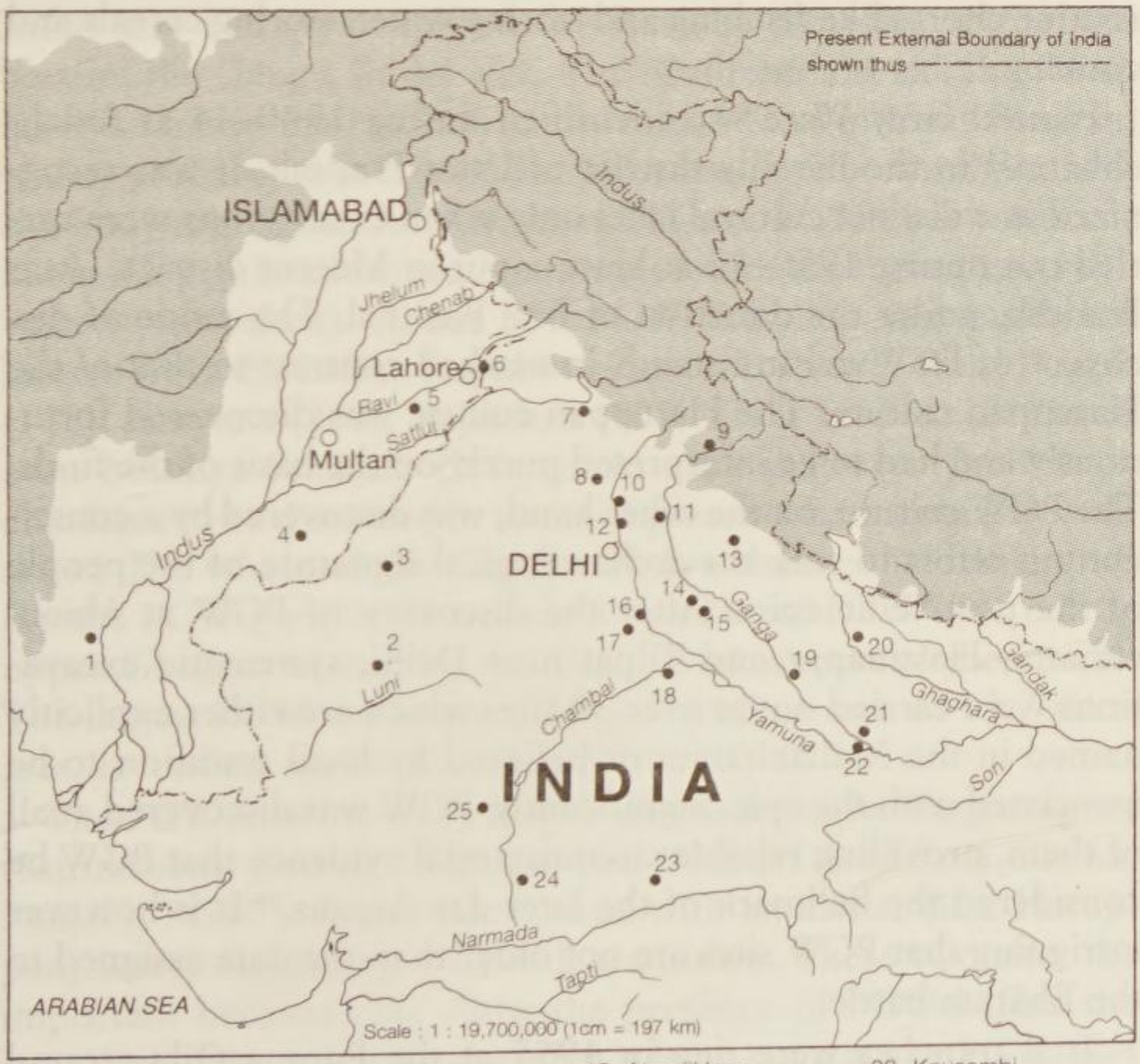
An ingredient of many a culture was the Black-and-Red Ware (BRW). Here the pottery is marked by black and red colours distributed non-uniformly over the surface. The effect can be produced by using different techniques. Black-and-Red Ware occurs in a large number of different cultural contexts spread over a vast geographical area and a long time bracket—from the middle of

the third millennium BC right up to the early centuries of the Christian era. It therefore cannot be assigned a cultural identity.[52]

PAINTED GREY WARE

The late Harappan cultures in north India finally made way for the Painted Grey Ware (PGW) culture, which can be assigned the bracket c. 850–400 BC (map 3).

Atranjikhera has yielded a calibrated radiocarbon date of 1034 BC from the mid-PGW levels (Period III). Three other samples from the same period, however, consistently yielded much younger dates of 435, 410 and 409 BC. Period II also provides younger



1 Lakhiyo Pir
2 Jodhpur
3 Sardargarh
4 Satwali
5 Harappa
6 Gharinda
7 Ropar
8 Bhagwanpura
9 Thapli
10 Hulas
11 Hastinapur
12 Alamgirpur
13 Ahichchhatra
14 Jakhera
15 Atranjikhera
16 Mathura
17 Noh
18 Kotwar
19 Pariar
20 Sarvasti
21 Sringaverapura
22 Kausambi
23 Besnagar
24 Ujjain
25 Gilund

MAP 3. Painted Grey Ware sites (after Lal 1992, map 13)

dates: 778 and 519 BC. This suggests that the 1034 BC samples cannot be considered representative. If we ignore it, then no PGW site is much older than 800 BC.[53]

Painted Grey Ware is the name given to fine, wheel-made, well-fired grey pottery on which patterns in lines and dots were painted with black pigment before firing. The painted designs include criss-cross lines, a chain of short spirals, a row of the Greek letter sigma, patterns involving circles and squares, and svastikas. There are however no human or animal figures. Even though the culture is named after this ware, PGW was a deluxe production, constituting no more than 10 to 15 per cent of the total pottery. The majority of the pottery was a red ware, used for routine chores like fetching and storing water, storing cereals and cooking.[54]

Painted Grey Ware was identified during 1940–44 at Ahichchhatra[55] in the Bareilly district of Uttar Pradesh. It was recognized as a distinct cultural label only when excavations were carried out during 1950–52 at Hastinapur in Meerut district, Uttar Pradesh, under the direction of Braj Basi Lal. The mode of discovery of PGW culture stands in marked contrast to that of the Harappan culture. The Harappan culture was discovered fortuitously and had to be interpreted purely on the basis of the finds. The PGW culture, on the other hand, was discovered by a conscientious effort to seek the archaeological signature of the people of the post-Vedic epics. After the discovery of PGW at Ahichchhatra, Hastinapur and Tilpat near Delhi, systematic excavations were carried out at over 30 sites which are either explicitly named in the Mahābhārata or believed by local tradition to be associated with the epic. Significantly, PGW was discovered at all of them, providing reliable circumstantial evidence that PGW be considered the hallmark of the later-day Aryans.[56] It is however intriguing that PGW sites are not older than the date assigned to the Bhārata battle.

Trial trenches were dug in 1955 at the Purana Qila mound in Delhi, which is believed to be the site of Indraprastha (said to be founded during the Mahābhārata time). PGW was uncovered from the lower level of the mound. The excavators returned to the site for three seasons during 1969–70. The work failed to reveal a regular PGW horizon. At the post-PGW Mauryan-

period levels, a few sherds of PGW were found (some of which had been used for playing hopscotch). This indicates that the regular deposits of PGW must have been confined to a rather small area which must have been located near by. Thus, all that we can say with certainty is that the earliest settlement in the Purana Qila area belonged to the PGW period. No dates are available nor have any remnants of a settlement been found.[57] Connecting this piece of evidence with Indraprastha is plausible but an extrapolation all the same (chapter 9).

The PGW sites are spread over a vast area, measuring about 1400 km from west to east and about 900 km from north to south. The distribution extends from Lakhiyo Pir on the lower Indus and Harappa itself on the Ravi, in the west, to Sravasti beyond the Ganga, in the east. The northernmost site known so far is Thapli in the Himalayan district of Tehri in Uttar Pradesh, which probably was a wood-supply centre. The southernmost site known is Ujjain. At Sravasti and Ujjain, PGW does not occur in an independent horizon but is mixed with the subsequent NBP ware[58] (see below). About 850 PGW sites, big and small, are known from the Indian Republic alone, spread over (east) Punjab (108), Haryana (258), Rajasthan (101), Uttar Pradesh (218) and even Madhya Pradesh. (It is unfortunate that even prehistoric data have to be discussed in terms of present-day national boundaries.) The whole of the Ghaggar-Hakra channel held an appeal for the PGW people. There are a number of PGW sites on the upper Ghaggar as well on the lower (Hakra) part of the course. The largest PGW site known, Satwali with an area of 13.7 hectares, is located on the Hakra bed.[59]

The PGW sites have a variety of antecedents. At Bhagwanpura (Kurukshetra district, Haryana) and Dadheri (Ludhiana district, Punjab), PGW is found interlocked with an earlier (late Harappan) ware, suggesting a smooth transition. These two sites are important because they show the presence of PGW before the Iron Age. (Iron was introduced at a later stage at the PGW sites like Noh in Rajasthan, just west of the Yamuna, and at Atranjikhera, in Etah district, Uttar Pradesh.) Thermoluminescence dates from Bhagwanpura suggest that the late Harappan phase (sub-period IA) lasted from c. 1700 BC to c. 1300 BC.[60] In about 1400 BC, the Plain Grey Ware-using people arrived, who later

introduced the Painted Grey Ware. There are other sites such as Ropar on the Satluj and Alamgirpur (Meerut district, Uttar Pradesh), where there is a distinct gap between the late Harappan and PGW layers. This suggests that the Harappans had abandoned these sites before the PGW people occupied the mounds. At Hastinapur, the PGW layer lies over a thin layer of Ochre Coloured Pottery. At Jodhpura, a Black-and-Red-Ware layer intervenes between OCP and PGW, while at Atranjikhera and Noh, PGW succeeds BRW. In addition, there are many sites where PGW marks the first settlement.[61]

While Harappa and Mohenjodaro were dug up horizontally without regard to stratigraphy, most PGW sites have been explored for stratigraphy but not excavated horizontally. Consequently, the available information is sketchy, making it difficult to decide how typical a particular find is. We do not know whether at these sites a separate quarter was earmarked for artisans. None of the sites, however, can be called a city or a town.

Material evidence suggests that the inhabitants of PGW sites were pastoral-agriculturists whose diet included apart from wheat, barley and rice, mutton, pork, beef, venison (deer's meat), fowl, and meat of river turtles. At Bhagwanpura, the earliest structures were thatched huts or huts of wattle and daub. In the next phase appeared mud-walled houses. Burnt bricks, though attested, were not used for house construction. They were probably used in religious structures like altars, and so on. Glass manufacture appears for the first time during the PGW phase. There is hardly any evidence of trade, although it is certain that iron ore and semi-precious stones must have been imported. Gambling as a pastime was in vogue, as implied by the discovery of gamesmen from Noh and Mathura and an oblong bone dice from Alamgirpur.[62]

Painted Grey Ware was succeeded by a new and striking pottery, commonly known as Northern Black Polished Ware (NBPW), which is assigned the time bracket c. 600–100 BC. At Taxila, NBPW appears much below the level containing the Alexandrian coins. This pottery has a highly lustrous surface, is wheel-made, normally thin and well fired, giving the vessel a metallic ring.[63]

With the archaeology of Mahābhārata-named sites as a feather in his cap, B. B. Lal was entrusted in 1975 with the archaeological

exploration of the Rāmāyaṇa-named sites. Under this project, a number of sites named in the epic were excavated: Ayodhya, Nandigram, Sringaverapura, Bharadvaj Ashrama and Chitrakuta. Only details on Sringaverapura ("in the revenue limits of Singrur, a small village" in the Allahabad district of Uttar Pradesh) have been published.[64] The oldest inhabitation here is dated c. 1050–1000 BC. There then seems to be a break of about 50 years in occupation. The next culture appears on the scene in c. 950 BC. Both these cultures are believed to be pre-Aryan. PGW makes its appearance "in a limited quantity" in about 800 BC. As expected, the next layer shows NBPW.[65] At Ayodhya, the oldest pottery excavated is not typical PGW, but is "rather coarser in fabric and texture, and has some fuzzy painted lines." Ayodhya is properly speaking an NBPW site and thus younger than Sringaverapura as an Aryan settlement. As the excavators point out in their research paper:[66] "It is Sub-period IIIA [characterized by the use of NBP Ware] that constitutes the lowest common denominator at the

TABLE 8: Chronology of prehistoric India

c. 7000 BC	Advent of (wheat and barley) farming, animal husbandry and settled life at pre-pottery, neolithic Mehrgarh in Baluchistan.
c. 4700 BC	Handmade and coated-basket pottery. Appearance of cotton.
c. 4000 BC	Wheel-made pottery. Use of copper.
c. 3500–2500 BC	Early Harappan regional cultures.
c. 2500–2000 BC	Centralized mature Harappan phase with urban centres and seaports. Double cropping in Gujarat.
c. 2000–1300(?) BC	Late Harappan localized cultures. Double cropping in northwest India.
c. 850–400 BC	Painted Grey Ware (PGW) culture of pastoral-agriculturists on merger with the local late Harappan culture. Limited use of iron.
c. 600 BC	Beginning of Indian historical era.
c. 700–100 BC	Northern Black Polished Ware (NBPW) culture with full-fledged use of iron and urbanization of the Ganga Plain.

sites associated with the Rāmāyaṇa story, viz., Ayodhya, Sringaverapura, Bharadvaja Ashrama, etc."

Painted Grey Ware marks the advent of the Iron Age in India, but the use of iron was limited and the people still depended largely on copper tools. Their technological capabilities were limited and their existence simple and hand-to-mouth. The succeeding NBPW culture was a full-fledged iron culture which enabled its people to undertake the wholesale clearance of jungles, make full use of the fertility of the Ganga Plain, and found cities and empires. Northern Black Polished Ware would have been used by Gautama Buddha and Mahāvira as also by the ruling dynasties of the Śiśunāgas, Nandas and Mauryas. With this pottery, India entered the historical age.[67] Table 8 summarizes the chronology of prehistoric India.

6

INDO-IRANIAN HABITAT

Though the latitude's rather uncertain,
And the longitude also is vague.

—William Jeffrey Prowse, *The City of Prague*

Archaeologically the Vedic people have been a great disappointment to the professionals and laypersons alike. Most people have unwittingly assumed that the prosperity which the Aryans came to enjoy in the post-Vedic phase in the fertile Ganga Plain had belonged to them throughout their existence in the past. It was therefore hoped that the archaeologists would come up with some spectacular ruins.

ARCHAEOLOGICAL FINDS AND LITERARY EVIDENCE

At the professional level, it has not been possible to position archaeological finds in the context of literary texts. There is no material culture in India that can be explicitly associated with the Ṛgvedic people. As for the post-Ṛgvedic period of the Brāhmaṇas and Sūtras, there is unanimity in associating it with the Painted Grey Ware. There is however nothing at the PGW sites that can be explicitly associated with the literary texts or vice versa. In fact these sites come nowhere near their picture painted by the epic. The Mahābhārata's Hastināpura is the famed capital of the Kurus. The archaeologist's Hastinapur is a small village where people lived in huts and bred cattle. It does not show remains of a palace, temple, fort or anything that one would normally associate with the capital of a kingdom.[1]

Some artefacts at the PGW sites are suggestive of rituals described in the Śrautasūtras. At Banawali (Hissar district, Haryana), a pit belonging to post-Harappan levels has yielded fragments of two animal figures, most probably bulls, with a vertical

hole pierced just behind their front legs. Bones were also found in the same pit.[2] At Bhagwanpura (Kurukshetra district, Haryana), charred tortoise shells have been found. In addition, 21 post holes have been found in a trench, along with four querns and three pestles.[3] Although the excavator believes them to be a part of a grain grinder's hut, the number reminds one of the 21 sacrificial posts (yūpas) erected for tying animals in an aśvamedha yajña. Also, the tortoise is one of the animals used in the agnicāyana yajña,[4] although its bones may merely denote its being a food item.

The most significant result comes not from an examination of data from individual sites but from their general distribution. Aryan presence in the Ganga Plain is indicated by the PGW culture or the Northern Black Polished Ware (NBPW) culture that followed it. In other words, large-scale inhabitation east of the Yamuna-Ganga (Yaga) doab did not take place until after 900 BC. This is not surprising. The Ganga Plain was the seat of thick monsoon jungles that had to be cleared for agriculture and settlement. This task was beyond the capabilities of the Copper Age people. Copper is too soft for any practical use. Its alloy with tin, bronze, can be used for making ornaments, arrows and axes. But the old-world supply of these metals was highly restricted. That is why Copper Age civilizations were all confined to either semi-arid or weak-river areas. This can be seen from the geographical extent of the Harappan civilization which generally avoided the upper course of major rivers. The handful of Harappan settlements east of the Yamuna were understandably located on the small rainwater tributaries. The Harappans did not cross the Ganga. Most Harappan sites in north India became the early PGW sites because the technological level was the same in both the cases.

The clearing of the Ganga Plain forests had to await the development of iron technology.[5] The technique would have been to first burn down the jungles and then remove the rumps with axes. The Mahābhārata itself provides an example of such a clearing, when the Khāṇḍava forest was burnt down to found Indraprastha. Another example is provided by Śatapatha Brāhmaṇa (1.4.1.10–16), according to which Māṭhava, the king of Videgha (Videha), starting from Sarasvatī "followed Agni [fire] as it went burning along this earth towards the east".

The fact that the Aryan presence east of the Yaga doab is an Iron Age phenomenon has some far-reaching consequences. The Ṛgveda is a pre-Iron Age document. Its authors could not possibly have been familiar with the territory east of the Ganga. This territory contains three rivers whose names figure in the Ṛgveda: Gaṅgā itself, Gomatī and Sarayu. Gaṅgā is an inconspicuous river in the Ṛgveda. Its name appears in a very late hymn. It has been accepted for a long time on contextual grounds alone that the Ṛgvedic Gomatī is not the Gomati of east Uttar Pradesh but the present-day Gomal, a tributary of the Indus in Baluchistan.[6] If the present-day Gomati is not the Ṛgvedic river, most probably it was not known to the Ṛgvedic people at all. This makes it even less likely that a river further east would have been known. The present-day Sarayu (Sarju) of the Ganga Plain cannot therefore be the Ṛgvedic Sarayu. Where then was the Ṛgvedic Sarayu?

The same problem can also be formulated in the Purāṇic context. The Mahābhārata's Indraprastha is a PGW site whereas the Rāmāyaṇa's Ayodhyā belongs to the NBPW culture which succeeded PGW. This is curious because, according to tradition, the Rāmāyaṇa preceded the Mahābhārata. In fact, all the Rāmāyaṇa-named sites are systematically later and more easterly than the Mahābhārata-named sites. Another intriguing fact is that the Mahābhārata sites are not older than the battle but are either of the same age or younger. How do we resolve this paradox? It will be absurd to say that the archaeological evidence should be rejected. Some experts have even suggested that contrary to tradition, the Rāmāyaṇa is younger than the Mahābhārata.[7]

A little consideration will show that such an assertion is untenable. First, the archaeological paradox of Indraprastha versus Ayodhya is a problem for the present-day historians. It could not have bothered the keepers of the Purāṇas. No one stood to benefit by meddling with the genealogical order. Secondly, even if some one had wanted to, it is not clear how he or she could have done so. The Purāṇas say that originally a single Purāṇa was compiled at the Mahābhārata time, after the arrangement of the Vedas but before the composition of the Mahābhārata. It is this original Purāṇa which in different parts of the country and in different hands led to a multiplicity of Purāṇas. If any tampering took place, it must have occurred at the level of the original

Purāṇa. Otherwise the tradition will not have been uniformly prevalent. Now, the Purāṇas give not only the genealogies of Rāma and Kṛṣṇa but of other royal houses also. There are many synchronisms between various dynasties which tie the genealogies into a fine network. Even if there were some reasons for reversing the chronologies of Rāma and Kṛṣṇa, it could not have been done without introducing glaring contradictions in the accounts.

Finally, such a drastic exercise will still not solve the archaeological problem. Rāma is not Ayodhyā's founder. Ayodhyā is his dynasty's ancestral capital, said to have been founded by Ikṣvāku himself, 64 generations previously. But the present Ayodhya was founded at most only a couple of generations before Gautama Buddha, himself an Ikṣvāku. The Purāṇas tell us that the dynasty did not last very long after the Buddha; there were only six kings after him.[8] In other words, Ayodhya as we know it today is more a commemoration of the closing years of the famed Ikṣvāku dynasty rather than of its beginning.

Further, two problems still remain. Why are the Mahābhārata sites not older than the battle and why do the Mahābhārata and Rāmāyaṇa sites show west-east clustering? One way out of the dilemma is to say, following the nineteenth-century European Indologists, that the Purāṇic tradition should be rejected outright. We, however, assume that the Purāṇic tradition is in essence correct. In any case, the problem is independent of the Purāṇas; it is equivalent to ascertaining the geography of the Ṛgveda consistent with the archaeological evidence. We propose the following hypothesis to reconcile literary and scientific evidence.[9]

The compilation of the Ṛgveda was taken up after c. 1700 BC in Afghanistan by a section of the Indo-Iranians, designated the Ṛgvedic people or Indo-Aryans. After 1400 BC, when the late Harappan cultures were in decline, the Ṛgvedic people entered the Punjab plain and eventually spread further eastwards up to the Yaga doab. In about 900 BC, the compilation of the Ṛgveda was finally closed and the Bhārata battle fought. Armed with the newly acquired iron technology, the Aryans moved east of the Ganga. The migration was not in a single procession but in phases. The first entrants were the Mahābhārata people, the Puru-Bharatas, who settled close to the Yamuna. The Ikṣvākus,

the inheritors of the Rāmāyaṇa, came later and moved further eastwards.[10] During their migrations, the Indo-Aryans carried with them not only their religious beliefs, rituals and hymns but also place and river names which they selectively reused.

This hypothesis has some features in common with the earlier studies: the central Asian connection, the date of Aryan ingress into India and of the closure of the Ṛgveda. There are two important differences. The present hypothesis postulates a much longer time span between the first and the last hymns of the Ṛgveda and, more importantly, places all but the latest hymns in Afghanistan.

Differential migration of the Aryans into India is independently suggested by linguistic evidence. Older parts of the Ṛgveda as well as the Avesta show a distinct preference for the r-sound over the l. Where the other Indo-European languages have r, the Ṛgveda also has r (rajan: Latin rex; ratha: Latin rota). But even when the associate languages have l, the Ṛgveda uses r (sūrya: Latin sol; pur: Greek polis). But the later portions of the Ṛgveda use l as well as r. In these portions l is eight times as frequent as in the earlier portions. In the later text, the Atharvaveda, l is seven times as frequent as in the Ṛgveda taken as a whole. Classical Sanskrit, like the later Ṛgveda, uses both l and r. Significantly, the r-l divide within the Ṛgveda is reflected in the Prakrits also. The western and northwestern dialects use only r. On the other hand, in certain eastern dialects, notably in the inscriptions of Aśoka and in Māgadhi, only l is found.[11]

It is thus clear that the language of the Indo-Aryans was not uniform and the linguistic divide came to correspond to a geographical divide as well. Vedic texts tell us that the bulk of the Ṛgveda was composed under the auspices of the descendents of Bharata. These people must have been the speakers of the r-only dialect. According to the hypothesis presented here, they entered India first and settled in the western parts. The Prakrits of the region retain the early Ṛgvedic r-only feature.

The Ṛgveda does not contain any hymns that refer to the Aryan homeland and the migrations from it. There is however no basis for supposing that if such hymns had been composed they would have been preserved, and consequently since they are not extant they were never composed. The absence of evidence does not constitute evidence of absence.

By the time the Ṛgvedic hymns were taken out of the hands of the families which had composed them and were supplemented and arranged as a single text, the Aryans had already been in India for close to five centuries. It is quite possible that a conscious decision was taken by the editors of the Ṛgveda to exclude from the canon all those hymns which were explicitly extraterritorial in content and therefore considered redundant, especially if these hymns happened to refer to rituals later discontinued. It is on record that there existed Ṛgvedic recensions apart from the Śākala, which have not survived except for some fragments. We do not know what these recensions contained. We should therefore not read too much into what is not mentioned in the Ṛgveda but make the best of what is.

AVESTAN LANDS

Fortunately, the Ṛgveda's geographical silence (or lapse) is made up for by its close ally the Avesta which provides explicit geographical information. An old Yast, the Zamyad Yast (10.66), refers to lake Kasavo that receives the Haetumant river. Haetumant is the Helmand River; Kasavo then must be the Hamun in the Seistan. The first chapter of the later Avestan text Vendidad lists 16 lands which Ahura Mazda created and described to Zarathushtra. Some of these lands including the first, Airyana Vaejo, said to be the abode of Yima (Yama), appear to be mythical. Ten of the 16 lands certainly existed. In the case of most of these, we know the geographical position because their names can be followed from the Achaemenian kings or Greek geographers down to modern times[12] (see table 9 and maps 4 and 7).

It is noteworthy that all these areas are rather small in size, as can be guaged from the fact that the districts of the two adjoining rivers Arghandab and Helmand are listed separately. Three of these names, Haroyu, Harahvati and Hapta Hindu, also occur in the Ṛgveda in an equivalent form: Sarayu, Sarasvatī and Saptasindhavaḥ.

These lands in central Asia, Afghanistan and east Iran must be the ones that accepted Zoroastrianism relatively early. The Avesta as well as later-day Pahalvi commentaries make central Asia the seat of early activities of Zarathushtra. King Kavi Vishtaspa, the

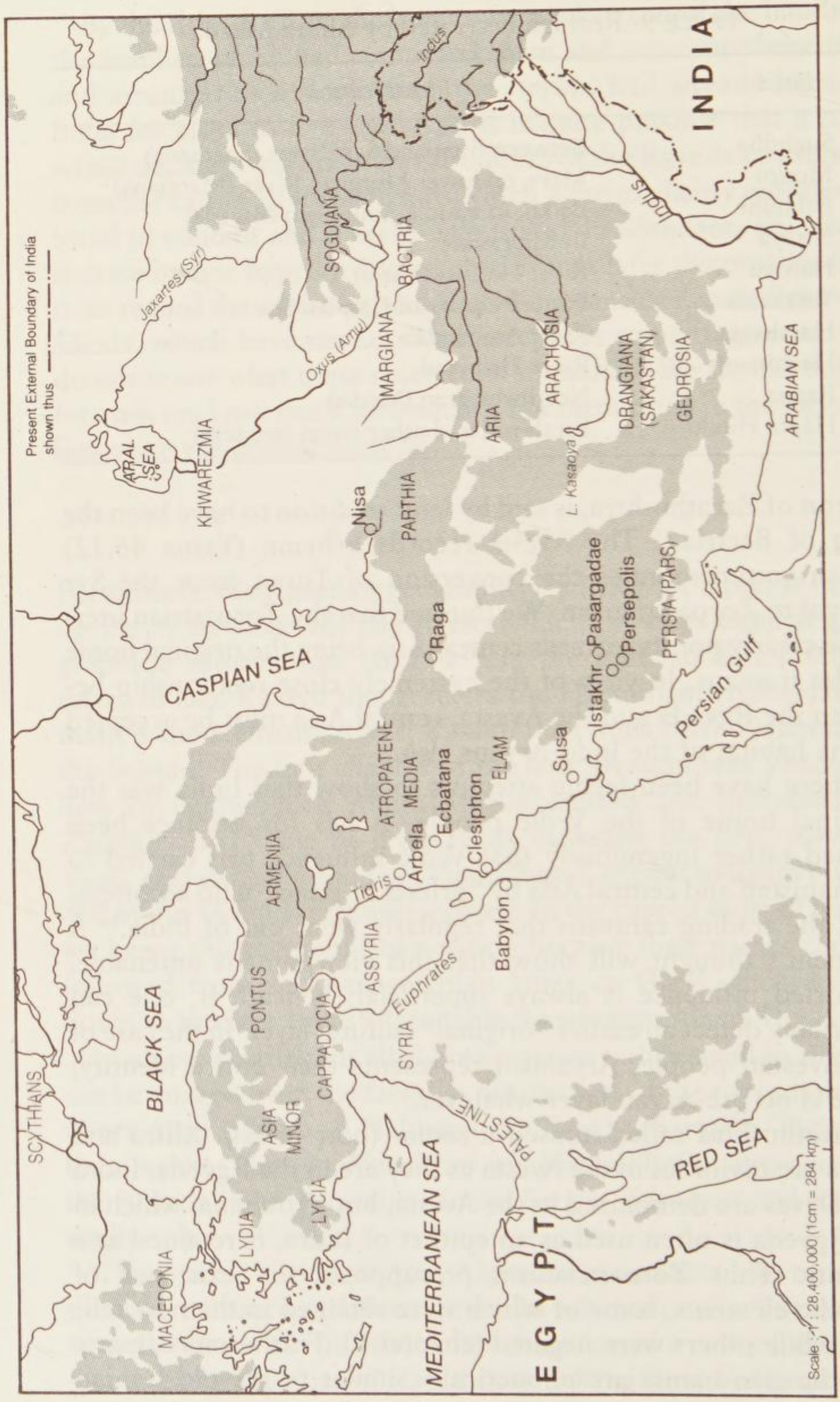
TABLE 9: Real lands created by Ahura Mazda

Land	*Identification*
1. Sughdha	Between Amu and Syr Rivers (Sogdiana)
2. Mouru	Merv, on lower Murghab River (Margiana)
3. Bakhdhi	Balkh, in middle Amu Plain (Bactria)
4. Nisaya	In Khurasan?
5. Haroyu	River Hari-rud (Aria)
6. Vehrkana	Eastern corner of Caspian Sea
7. Harahvati	River Arghandab
8. Haetumant	River Helmand
9. Ragha	Northwest Iran (Media)
10. Hapta Hindu	Farah-rud and other rivers (see text)

patron of Zarathushtra, is said by later tradition to have been the king of Bactria.[13] The Avesta records a hymn (Yasna 46.12) which commemorates the conversion of Turan (near the Syr Darya) to Zoroastrianism. We thus see that the Zoroastrian literature clearly points towards central Asia being the original home of the Iranians. In view of the extremely close relationship between the Ṛgveda and the Avesta, central Asia must be accepted as the habitat of the Indo-Aryans also.

There have been feeble attempts to show that India was the original home of the Vedic people. It has for instance been argued rather ingenuously that Vedic influence was carried to Afghanistan and central Asia by "priests or poets" who accompanied the trading caravans that regularly went out of India.[14] A moment's thought will show that this viewpoint is untenable. Imported influence is always superficial; beneath it, one can invariably detect an earlier "original" cultural layer. In the case of the Avestan people, Aryanism represents their entire identity; there is no pre-Aryan layer whatever.

Zarathushtra called himself a zaotar (hotṛ priest). Mitra and Asura are divinities in the Avesta as they are in the Ṛgveda. Indra and Devas are demonized in the Avesta, but Vṛtrahana, which in the Ṛgveda is often used as an epithet of Indra, is retained as a divinity. Thus Zoroastrianism presupposes the existence of Ṛgvedic elements, some of which were retained in the new religion while others were negated (chapter 8). Furthermore, many Ṛgvedic clan names are phonetically similar to the old Iranian



MAP 4. Imperial Iran

names preserved by Greek historians: Pārāvata, Kāmboja, Parśu, Pārthava, Sṛñjaya, and others. All this evidence unequivocally makes the Vedic and Avestan people one.

The Avestan and Pahalvi texts consistently point towards their central Asian antecedents. There is never any indication that the Avestan people were ever connected with India. On the contrary, there is evidence to show that they were not familiar with India. The Avesta recognized Sindhu as a generic name for a river (as in Hapta Hindu) but is not aware of the river Indus. The Avestan sources believed the Amu (Oxus) and the Indus to be one and the same river. This river was given the name Veh and was assumed to surround the world eastward.[15]

Even if we assume for the sake of argument that Iranian Aryans were once stationed in India, then they would be expected to go straight to Afghanistan and Iran. There would not have been any reason for them to make a detour to central Asia.

There is another reason why the joint Indo-Iranian home, prior to their dispersal, should be located in central Asia/Afghanistan. People migrate from their homelands when they face a shortage of food or a hostile environment. It is thus understandable that people from central Asia and Afghanistan should come down to the Indian plains. It however does not stand to reason that people on their own volition should leave the comforts of the Indian subcontinent and migrate to the difficult terrain of Afghanistan, Iran and central Asia.

To sum up so far, though the Iranians and Indo-Aryans are closely related, India does not figure in the Avestan and Pahlavi literature at all. This shows that India could not have been the original home of the Avestan people. Secondly, the Avestan people do not exhibit any cultural layer preceding the Aryan. This shows that as in the case of the Indo-Aryans, the Aryan-ness of the ancient Iranians is intrinsic and not acquired. We therefore conclude on the basis of the well-established central Asian connection of the Avestan people that the joint habitat of the Vedic and Avestan Aryans must have been in the same general area.

Thanks to the cult of Soma/Haoma which was shared by both the Ṛgvedic and Avestan Aryans (but was not known to the Indo-Europeans), we are provided with an important clue to their common residence, by natural history.

SOMA/HAOMA

Soma is a celebrated plant in the Ṛgveda as well as in the Avesta, where it is called Haoma, later shortened to Hom in Pahalvi. A drink of the same name was extracted from the plant by pressing or crushing its stalk, for offering to the gods and for drinking. (The name Soma comes from the root su, "to squeeze".) The Soma cult's significance is apparent from the fact that the Ṛgveda devotes a full maṇḍala to it. The longest hymn in the Ṛgveda (Ṛv 9.97) is addressed to it. In addition, there are numerous references to Soma in other hymns.[16] The Haoma plant figures in three hymns (9–11) in the Yasna.[17] Yasna 9 is called the Hom Yast, while Yasna (10.18) says, "These are thy Gathas, holy Haoma." The use of the term Gatha is significant because the Yasts believed to be composed by Zarathushtra himself are designated Gathas. Interestingly, the Zarathushtrian Gathas do not make any reference to Haoma.

While Haoma is offered to all the gods, Soma, also called Indu, is particularly associated with Indra who handsomely rewards his worshippers. The Ṛgvedic and Avestan mythologies associated with Soma/Haoma run parallel. Soma/Haoma is of celestial origin. In the Ṛgveda (Ṛv 4.27.3; 9.72.2), an eagle or falcon brings it to the earth against the wishes of the celestial guards like Kṛśānu, who is known to the Avesta as Keresani (Yasna 9.24). In Ṛv (8.12.16) Indra drinks Soma by Trita Āptya's side. Vālakhilya (4.1) mentions Vivasvat's son Manu and Trita among the ancient sacrificers whose Soma had once pleased Indra. The Hom Yast lists the names of early Haoma-pressers, which in Sanskritized form are Vivasvat, the father of Yama; Āptya, the father of Traitana; and Trita whose two named sons are not known to the Ṛgveda.

The Ṛgveda makes a sharp distinction between those who press Soma and those who do not: "You scattered the settlement of the non-pressers, maintaining your upper hand as the Soma drinker" (Ṛv 8.14.15); "May we win in fights over those who do not press [Soma]" (Ṛv 1.110.7). There is rivalry among the Soma drinkers themselves, with different sacrificers aiming to enlist Indra's support. "When you have mounted on your car, let your yoked Boy Steeds carry you past other men's libations" (Ṛv 8.33.14). Or, more simply, "Let not other sacrificers hold you"

(Ṛv 2.18.3). A specific instance of rivalry within the Soma club is provided by Ṛv (7.32.2): "Indra preferred Vasiṣṭha's to the Soma pressed by Pāśadyumna Vāyata".

Soma is the mascot of the Aryans. Whatever the Avestan and the Ṛgvedic people needed or wished for at the individual and collective level, they asked Soma/Haoma to provide. Soma/Haoma is thus perceived as a giver of immortality, health and longevity, offspring, happiness, courage, strength, victory over enemies, wisdom, understanding and creativity. The attributes of Soma/Haoma fall into two categories. The culture-specific attributes tell us about the needs, fears, wishes, aspirations and accomplishments of the Ṛgvedic and Avestan people. The role assigned to the Soma plant is incidental; these attributes could easily have been endowed on any other plant. In contrast, there are the object-specific details which tell us about the plant itself.

First, the culture-specific attributes. According to Yasna (9.23), Haoma grants good husbands to maidens. In Ṛv (8.80), a maiden, Apālā by name, plucks Soma twigs by the wayside and chews them with the purpose of becoming attractive to men. Haoma provides brilliant and righteous offspring to pregnant women (Yasna 9.22). Anyone who maltreats Haoma is cursed to remain childless (Yasna 11.3). As if aware of this, in Ṛv (8.31.5), "with constant draught of milk, husband and wife with one accord press out and wash the Soma juice", no doubt as a prelude to sexual intercourse. The Soma drink enables the poetic drinker to compose a hymn. Therefore, Soma is very frequently called a Kavi, "poet". Soma is "the procreator of thoughts" (Ṛv 9.95.5) and is ṛṣikṛt, "the maker of seers" (9.96.18). In Ṛv (9.107.18), "the poet Soma procreates the thought". The composer of Ṛv (3.43.5) plainly asks: "Will you not make me the protector of people, make me the king, O Soma-drinking lord, make me the ṛṣi after I have drunk of Soma? Will you not give me of the excellent Amrta?"

In addition to these psychological attributes, we obtain some valuable object-specific physical charcteristics. Soma prevents sleep; it keeps the drinker awake and alert.[18] "The Gods seek him who presses out the Soma; they desire not sleep. They punish sloth unweariedly" (Ṛv 8.2.18). Indra is awake because he has drunk Soma (Ṛv 8.92.33). Soma is jāgṛvi, "awake" (Ṛv 9.36.2; 9.44.3; 9.106.4).

It seems that some of the Ṛgvedic poetry was composed at night after drinking Soma. As Ṛv (5.44.14) puts it, "The sacred hymns love him who wakes and watches; to him who watches come the Sāman verses. This Soma says to the man who watches, I rest and have my dwelling in thy friendship". In Ṛv (9.97.37), Soma is awake and has become "a singer most like Aṅgiras". In the same creative spirit, the poet in Ṛv (8.48.14) wishes that neither sleep nor idle talk should govern him after he has drunk Soma. Soma's ability to keep one awake was known outside the poetic circles also. To the gambler in Ṛv (10.34.1), the die that never sleeps is dearer than the deep draught of Soma from Mūjavat.

Of all the Indo-Europeans, the Indo-Iranians are the only ones who took to composing (and preserving) hymns. One wonders whether this is due to Soma. Soma is called an ancient plant (Ṛv 9.98.11). It was a matter of pride to have Soma drinkers among one's ancestors. "With you, O Soma Pavamāna, our wise fathers conducted their affairs" (Ṛv 9.96.11). Similarly, "Our Soma-drinking fathers, the most excellent ones, who came for the Soma drink" (Ṛv 10.15.8). Does this mean that in the community there were members whose ancestors had been outside the Soma fold?

The Soma/Haoma tree was leafless. The juice was extracted from the shoots or stalks, never from the fruits or berries. A number of terms are used to denote the stalks: aṁśu (literally "ray"), kṣip ("finger"), vakṣaṇa ("tube"), vāṇa ("cane"). All these terms indicate that the shoots were long and thin. In the Avesta, the shoots are called asu (corresponding to aṁśu). The term fraspa-rega is also used, where the word without the prefix fra corresponds to the English sprig. The processs of juice extraction is called milking in the Ṛgveda, no doubt owing to the resemblence between the stalks and the cow's teats. The term kṣip is particularly apt, because the stalks, like the fingers, had joints called parvan or parśu.

The colour of the stalk was ruddy (aruṇa), brown (babhru), or golden (hari) corresponding to zairi in the Avesta. (In the Avesta, the plant is called Haoma-zairi to distinguish it from three other Haomas, persons or deities.)[19] A very important characteristic of the Soma plant was that it was sweet scented (Yasna 10.4; Ṛv 9.97.19; 9.107.2).

The Ṛgveda (but not the Avesta) uses the term andhas to denote the whole plant as well as the extracted juice.[20] The significance of the term lies in the fact that it is cognate with the Greek word anthos, meaning flower. Here then we have an old Indo-European word with a change in meaning.

The Ṛgveda names a number of localities where Soma was consumed: Ārjīkā, Pastyāvant, Śaryaṇāvant, Suṣomā (a river), and others. Unfortunately, it is not possible to identify any of them.[21] An important piece of information is that Soma grew in the mountains. This fact is mentioned or alluded to in a number of places in the Ṛgveda. Thus Soma is called parvatāvṛdh, "mountain grown" (Ṛv 9.46.1). (In the Atharvaveda [3.21.10] the mountains are called Somapṛṣṭha, "carrying Soma on their back".) Ṛv (10.34.1) uses the term Soma Maujāvata, "the Soma from Mūjavat", which according to Yāska's Nirukta (9.8) was a mountain.[22]

Yasna (10.10) mentions Haraiti Bareza (also called Hara Barazaiti) as the Soma habitat. Haraiti is identified with Mount Elburz. "But it must be borne in mind that the name Elburz not only denoted the present Mount Elburz, a peak in the Caucasus, but was applied to the whole range of mountains extending from the Hindu Kush in the East to the Caucasus in the West".[23]

Yasna (10.17) quotes Zarathushtra as saying, "I praise all the Haoma plants, as many as there are on the high plateaus of mountains, as many as there are in the depths of the valleys, as many as there are in the gorges, which are tied into the bundles of women". Interestingly, while the Avesta shows familiarity with a much larger Soma-growing area than the Ṛgveda, the latter displays greater variety as regards the colour of the shoots.

The Soma ritual, though elaborate, comprised a number of simple steps: extraction of juice, its collection, purification, modification, libation and consumption. It is clear from the Ṛgvedic references that Soma pressing took place three times a day: in the morning, at noon, and in the evening. Yasna (10.2) refers to only two pressings a day.

There were two methods of extracting the juice from the Soma stalks. One could use a mortar (ulukhala) and pestle (mantha) for processing the plant. In Ṛv (1.28.3), a woman uses the mortar in preparing the drink and refers (Ṛv 1.28.5) to a

similar practice in "house after house". To the extent it is permissible to generalize from a solitary hymn, mortar-and-pestle was the preferred (more convenient?) method of preparing the drink by the householders. Significantly, the Avestan practice was also to use a mortar, called havana (Vendidad 14.8).

A woman "pushing [the pestle] backwards and forwards" had no place in the ritual. The ritualistic practice was to pound the stalks between two stones held by the hands. The stones, called adri or gravan (in singular) were held in high esteem. Three hymns (Ṛv 10.76; 10.94; 10.175) are dedicated to them; in addition, these stones figure in many other hymns. The stones were pounded with a loud sound to scare away the evil spirits. At least in the later rituals, holes were bored to increase the sound. The stones were placed on cow-hide (tvac) which acted as a receptacle for the juice. Sometimes the stalks were soaked in water to increase the yield (Ṛv 9.75.9).

The next step was to purify the juice. This was done by passing the juice through a strainer made of sheep's wool. The most common designation for the Soma juice passing through the strainer is pavamāna or punāna, the action itself being denoted by the verb pū. (It is significant that in Punjabi the word for straining is punanā as against chhānaṅā in Hindi.)

The juice was of the same colour as the stalks and of the same scent as the plant (Ṛv 9.97.9; 9.107.2). It could be taken either pure or mixed with other ingredients. The pure, unmixed Soma, called śukra or śuci, was offered to Vāyu and Indra. Vāyu is called śucipa (Ṛv 7.90.2, for instance) and śukrapūtapā (Ṛv 8.46.26); both meaning "pure-drinker". Vāyu and Indra are jointly called śucipa in Ṛv (7.91.4). A number of substances were available for addition to the pure Soma juice (described as tīvra, "astringent"): milk, curd, water, barley, clarified butter (ghee), and perhaps honey. For later reference, we may note that poppy or cannabis was never added (chapter 8). It is noteworthy that in the whole procedure, there was no time for fermentation, nor was any fermented beverage (surā) ever added to Soma.

There is a striking similarity between the Vedic agniṣṭoma and the Zoroastrian Haoma ceremony, both of which must therefore have originated in the (common) Indo-Iranian period.[24] In the Brāhmaṇa period, the Soma plant ceased to be a commonplace. It

became a prized item in the ritual, which was difficult to procure and so was first rationed and then substituted. In the Baudhāyana Śrautasūtra (6.14), the Adhvaryu asks the seller if the Soma came from Mūjavat, which obviously was still a source of supply. In the Yajurveda (Maitrāyaṇī Saṃhitā 1.160), the sacrificial offerings are hung from a tree with the words, "This is your portion, O Rudra! With this food pass by beyond the Mūjavat".[25] By now, Mūjavat is the civilizational outpost beyond which lies the unknown.

Kātyāyana Śrautasūtra (10.9.30) enjoins the priests not to give the genuine Soma to a Kṣatriya or a Vaiśya, even when it was available. They should instead be given the juice of the fruit of the Nyagrodha tree (*Ficus indica*, the Indian fig).[26] Śatapatha Brāhmaṇa (4.5.10.2–6) lists the substitutes for use in the ritual when Soma is not available. In decreasing order of preference, they are the Phalguna plant with the red blossom; the Śyenahṛta plant; the Ādāra plant; the reddish Durva plant; or as the last resort, any of the golden coloured grasses.[27] The explicit mention of red and golden suggests that the substitutes were chosen to resemble the original Soma in one parameter, colour. Also, the cow to be given as the price for Soma should be red brown with red-brown eyes, no doubt because this was the Soma colour (Śatapatha Brāhmaṇa 3.3.1.14).[28]

The Soma substitutes are linked to the original through mythology. When Gāyatrī was bringing Soma, a shoot fell down and became the Śyenahṛta plant. When the head of the sacrificial victim was cut off, the Ādāra took shape from the juice squirting forth from it. Therefore, Ādāra can be used in place of Soma.[29]

The choice of the Soma substitute was not unique but depended on the school. Tāṇḍya Mahābrāhmaṇa (9.5.1–3) recommends the use of the putika creeper (*Guilandina bonduc* or *Basella cordifolia*). Or else the dark grass known as arjunāni could be used. Various other substitutes figure in the Brāhmaṇas: syamaka (cultivated millet), muñja grass, kattṛṇa (a fragrant grass) and parṇa (a sacred tree, *Butea frondosa*).[30]

The Brāhmaṇas reverentially reserve the name Soma for the original Ṛgvedic plant and talk of its substitutes. The reverence disappears in the later period, when the term Soma becomes free of all encumbrances and is applied—normally suffixed with latā

or vallī (meaning creeper)—to local plants. (These terms do not figure in the Ṛgveda.) There must still have been some memory of the original plant because like the Ṛgvedic Soma, all Somalatās and Somavallīs are leafless with fleshy stems.

At the same time, the original Soma became a mythical plant. The Vedic commentators and Sanskrit lexicographers freely speculated on Soma. Amara Siṁha, the earliest of the Indian lexicographers (c. AD 450), lists many synonyms of what he calls Somavallī and also describes a plant Somarājī. Śabarasvāmi in his commentary on the Pūrvamīmāṃsasūtra (2.2.17) calls Soma a creeper that yields milky juice. The milky attribute was probably based on the Ṛgvedic statements that Soma was mixed with milk.[31]

Even the medical texts give fanciful descriptions. Suśruta Saṃhitā (29) says that although originally there was created one Somavallī, it was later divided into 24 varieties, one smelling like ghee, the other having leaves like those of garlic, still others looking like cast-off snake skins, and so on. Suśruta Saṃhitā (29.21–22) and Caraka Saṃhitā (1.4–6) both claim that Soma had 15 leaves which appeared one per day during the waxing moon (śuklapakṣa) and dropped off one by one during the waning moon (kṛṣṇapakṣa).[32]

To sum up thus far, the Ṛgvedic Soma (as well as the Avestan Haoma) is a scented leafless plant with thin and long-jointed juicy stalks, which grew in the mountainous region. The juice was extracted by pressing the stalks, and drunk unfermented. In effect, it was energizing, invigorating and anti-sleep. The Brāhmaṇa texts preserve the memory of the original Soma and prescribe various substitutes which, ranging as they do from grasses to trees, are unable to provide any clues to the master plant. In the later period, while on the one hand, the original Soma was mythified, on the other, the name Soma (often with a suffix) was given to a locally available field plant, usually a creeper.

Identity of Ancient Soma

The question of the identity of the ancient Soma was taken up in the wake of ever-increasing European commercial and colonial interest in India and its neighbourhood. There is no gainsaying

the fact that the Soma studies constitute the most disappointing part of the Indic scholarship. Instead of asking the question as to what the Ṛgvedic Soma/Avestan Haoma was, the studies were begun from the wrong chronological end. As part of the natural history survey that was progressively carried out in conjunction with the British territorial expansion, Latin names were assigned to Indian plants and juxtaposed with their native names, ascertained from local informers. This is how the various Somalatās, Somavallīs and Somarājīs all over the country came to acquire their botanical names. Next, one or the other of these plants was boldly declared to be the plant of *the* ancient texts. In the absence of collation of diverse field data and of any worthwhile acquaintance with ancient texts, that could constrain free flights of fancy, Soma was reduced to a mere Sanskrit name that could be tagged on to any of the superficially resembling plants. Somehow, an acquaintance with the Latin name of the plant gave the whole exercise a scholarly look.

In the whole debate lasting two centuries, not a single idea was rejected for good as being untenable nor was any accepted as constituting received wisdom on the subject. The debate remained open, superficial and repetitive, with the participants responding to each other rather than to the primary source material. Beating about the Soma bush became a badge of scholarship for a large number of European travellers and officers. Since the agenda was defined by dilettantes, even serious scholarship lost its moorings.

Historically, the European notice of Soma/Haoma began in 1771 with Du Perron's French translation of the Avesta. Du Perron quoted *Farhang Jahangiri* to say that Hom is a tree which grows in Persia in the mountains of Shirwan, Guillan, Mazendran and the neighbourhood of Yezd. It resembles sweet heather, its knots are very close to each other and the leaves are like those of jasmine. He went on to say that Hom did not grow in India and that "the Dasturs of India are in the habit of sending at the end of a certain season two Parsees to Kerman to search for the branches of Hom". The continuity in the Zoroastrian tradition provides a very valuable clue.[33] At that time, however, neither the Ṛgvedic Soma nor the Indo-Iranian connection was known. Du Perron's first-hand account therefore went unnoticed.

The first mention of Soma in English appeared in 1784 in Charles Wilkins's translation of the Bhagavadgītā. In a footnote, Wilkins added that Soma was a creeper whose juice was drunk at the conclusion of a sacrifice. The first attempt to identify Soma was made by William Jones in 1794 who proposed that Soma was a mountain rue.

Twenty years later, the exercise shifted from the library to the field. William Roxburgh, the first official superintendent of the East India Company's botanical garden in Calcutta during 1793–1814, prepared a catalogue of its 3,500 plants. This catalogue called *Hortus Bengalensis* was published in 1814. (His magnum opus *Flora India* came out in 1832.) Roxburgh identified the plant locally known as Somalatā with *Sarcostemma brevistigma* (= *Asclepios acida*), "a leafless bush of green succulent branches, growing upwards with flowers like those of an onion". He also pointed out that a different plant, a rue called *Ruta graveolens*, was also called Somalatā. More importantly, he observed that Himalayan plants do not grow in Bengal.[34] This point, of significance in the understanding of ancient texts, was ignored. The *Sarcostemma* saga had begun.

Sarcostemma juice however presented a problem. It was noted in 1832 that "native travellers often suck the tender shoots to allay their thirst".[35] It was pointed out in 1845 that "Farmers use S. brevistigma to rid their fields of white ants". Also, that the sap of the Asclepiads was bitter and acrid, and in the West Indies it was given to children in doses of a teaspoon to a tablespoon as a remedy for worms.[36]

These were hardly the attributes of a drink that was earlier enthusiastically imbibed three times a day. The contradiction perhaps had not been lost on the *Sarcostemma*-using Vedic commentators who were as clueless to the identity of the original Soma as the later-day European enquirers. John Stevenson in his 1842 translation of the Sāmaveda says that Soma is *S. viminale* and that "according to the commentator it is pressed and mixed with barley and allowed to stand for nine days". Fermentation of the juice was probably a means of camouflaging its bitterness. Displaying an orientalist bent of mind, not uncommon those days, William Dwight Whitney could say patronizingly in 1853, "The simple-minded Arian [*sic*] people ... had no sooner perceived that this

liquid had power to ... produce a temporary frenzy ... than they found in it something divine".[37]

In 1855, Max Müller dug up an old Ayurvedic verse[38] which described Soma as a black creeper, sour, leafless, yielding milk, having fleshy skin, dissolving (or producing?) phlegm, causing vomiting, and eaten by goats. Though the description fitted *Sarcostemma*, Max Müller asked a valid question: If this freely available plant was indeed *the* Soma, then why did the Brāhmaṇa-period priests have to use putika as a substitute? The passage was not taken up for discussion until 30 years later, when attention was drawn to its lateness and to the uncertainty whether the drug dissolved phlegm or produced phlegm.

Soon field data started becoming available from different parts of the country. In 1866, J. Forbes Watson described the "Telugu" Somalatā as *S. brevistigma*, and the "Sanskrit" Somalatā as *Ruta graveolens*.[39] In 1874, Arthur Coke Burnell pointed out that the Hindus on the Coromandel coast used *S. brevistigma* in their rites, while their counterparts on the Malabar coast used a different plant, *Ceropegia decaisneana* or *C. elegans*.[40]

In 1873, Rajendra Lala Mitra (1822[4?]–91), who later became the first president of the Asiatic Society, Calcutta, proposed a new hypothesis, doing away with the ancient texts as it were. The Soma juice, he said, was merely a figure of speech. The Soma plant did not provide a drink by itself. Rather, like hops, it was added to accelerate the fermentation of paddy and barley decoction to produce a kind of beer. It is a measure of the confused scholarship on the subject that this dubious hypothesis received wide support, including from Max Müller who concluded, to his satisfaction, that the original Soma was hop, later replaced by a *Sarcostemma*. He even suggested that the two words were etymologically related![41]

A hundred years after Du Perron, Haoma finally entered the debate. In 1878, Friedrich Spiegel reported afresh that the Indian Parsees sent their priests to Kerman to bring Haoma.[42] In December 1884, the naturalist A. Houtum-Schindler wrote from Teheran that the plant used by the Zoroastrians in Kerman and Yezd agreed with the *Sarcostemma*.[43] In 1885, the botanist (Sir) George Watt wrote that Dr Dymock, surgeon-general at Bombay, had identified the Haoma plant used by Bombay Parsees as

Periploca aphylla.[44] That these were misidentifications soon became obvious.

During 1884–86, the British sent a commission to Afghanistan to determine its boundaries in conjunction with a similar commission from Tsarist Russia. One of the members of the British commission was a professional botanist, James Edward Tierney Aitchison, who was asked to report on the Afghan flora and fauna. Earlier, Aitchison had supported the view that Soma was wine. The assignment made him change his opinion. While in Afghanistan, in 1885, he received from the Bombay-based Parsee scholar (Sir) Jivanji Jamshedji Modi samples of Hom for identification. Aitchison wrote back as follows:

> The specimens you sent me are the twigs of a species Ephedra.... A species grows all over this country—Baluchistan, Afghanistan, Kashmir and Western Thibet—which seems to be identical with the species received. This species is here, in all this country, called Hum (pronounced as the English word whom, also Huma). In Baluchistan, it, as well as totally a distinct plant, *Periploca aphylla* is called Hum. It grows equally on exposed hills and valleys, consisting of 'branches and sprigs', one mass of upright twig, if you notice, being made of joints like the joints of the fingers. When covered with male flowers, the bush (from 1 to 2 feet) is golden coloured, and the twigs are more or less so.... This plant has no leaves. It is all twigs and jointed. Among the Pathans of the Khyber pass and all over that country, the twigs are, with water, made into a decoction and employed very largely as a household remedy in sickness, and are considered as possessing health-giving and healing properties. Owing to a general likeness between the stiff rod-like growth, upright and erect, of the two plants, in Baluchistan the natives equally give both the same name. No one would mistake the jointed and true Hum for the non-jointed false Hum, *Periploca*.[45]

Aitchison concluded by saying, "Before your letter and specimens came, I had made up my mind that the Ephedra was the nearest to the 'Soma' plant that I got to, but as it was stated that the Parsees employed the twigs of *Periploca*, it rather put me out. Your specimens are all on my side."[46]

On return to England, Aitchison published in 1887 a technical report on his findings. Further support came in 1893 when Joseph Bornmuller wrote (in German) about his encounter with a Zoroastrian priest in Yezd carrying Hum, which he at once recognized as *Ephedra distachya*. He added that large quantities of it were dried and sent to Bombay every year.[47]

In 1912 Macdonell and Keith, unable to cut through the maze of conflicting opinions, declared in their *Vedic Index* that "it is very probable that the plant cannot now be identified".[48] By sweeping the Soma problem under the carpet, a very important clue to the geography of the Ṛgveda—which the Ṛgveda itself furnishes—was ignored. Two years later, in 1914, archaeological evidence on the use of *Ephedra* in central Asia about 2,000 years ago (but not necessarily as Soma/Haoma) was uncovered by Aurel Stein, who had been a student of the German Sanskritist Rudolf von Roth and was familiar with the official brief on Soma prepared for use by the Afghan Commission. An examination of widely distant cemeteries in the Lou-lan area of the Lop Desert in the western Chinese province of Xinjiang (Sinkiang) (chapter 8) revealed that in the case of six well-preserved graves in different cemeteries, small broken stalks of *Ephedra* had been tied up into little bunches on the edges of woollen shrouds. "In most of the other graves at these cemeteries the bodies and their belongings were found in a badly decayed state not permitting of close examination of details. But it may be safely assumed that the provision of such small packets formed part of the regular practice among the indigneous people".[49]

Stein recalled that the Chinese use an *Ephedra* called Ma-huang to get an alkaloid drug (Ephedrine). He, however, naively concluded that *Ephedra* could not be Soma, because *Ephedra* was bitter, while Soma was sweet. If he had read his Ṛgveda he would have realized that *Ephedra*'s inherent bitterness was consistent with the fact mentioned earlier that the pure Soma juice was called astringent. Finally, in 1951, Karl Friedrich Geldner, in his posthumously published German translation of the Soma hymns, declared that the Ṛgvedic Soma was indeed *Ephedra*.[50]

In reaction to the alcohol theory of Soma, there was proposed the hallucinogen theory which tried to equate Soma with hemp *(Cannabis sativa)*, a mushroom *(Amanita muscaria)*[51] or the wild

rue *(Peganum harmala)*. In the Ṛgveda and Avesta, there is no indication that the Soma/Haoma drinker loses his or her sense of reality. On the contrary, it is clearly indicated that s/he becomes more alert. Also, mushroom is odourless, while the Soma plant is scented. The wild rue is burnt rather than pounded. All hallucinogenic substitutes can thus be ruled out.

While *Sarcostemma* may well have been the commonly used substitute for Soma in the later period, there is now a growing consensus among experts in the field that "there is no need for a plant other than *Ephedra* for the original Soma.... *Ephedra* fits each and every detail of the texts".[52]

The various varieties of *Ephedra* look like bushes of leafless, jointed twigs, some prostrate, but mostly standing erect, 1–6 feet high (figure 2). The plant has a pine-like aroma and a strong astringent taste. It owes its importance to the alkaloid Ephedrine (C_{10} H_{15} ON) extracted from its twigs. The alkaloidal content of the plant increases with age. Twigs are much richer in alkaloidal content than the woody stems, while the roots are bereft of it. The best plants are four years old and in blossom; the best time for harvesting the twigs is after the rains but before the winter frost.[53]

Ephedrine is soluble in water and can be taken orally. It stimulates the nervous system, increases the intake of oxygen, and acts as a restorative and a mild anaesthetic agent. Compared to adrenaline which must be injected, Ephedrine's effect is slower and less intense but more persistent. It dilates the pupil and contracts the uterus. Soma's role as an aphrodisiac can only be attributed to the general feeling of euphoria that Ephedrine causes. In excessive doses, Ephedrine causes nervousness, insomnia, headache, vertigo, palpitation, sweating, nausea and vomiting. When the Ṛgvedic poet asks Soma to be "sweet to our heart" (Ṛv 8.68.7) and "wound not our heart with dazzling flame" (Ṛv 8.68.7), he is probably requesting for exemption from the effects of over-indulgence.

Ephedra's utility as a geographical diagnostic comes from the fact that it does not grow everywhere and all its varieties do not contain Ephedrine. Four species of *Ephedra* are native to the mountaineous regions of north India, Afghanistan and Iran: *E. gerardiana (E. vulgaris, E. distachya), E. major (E. nebrodensis),*

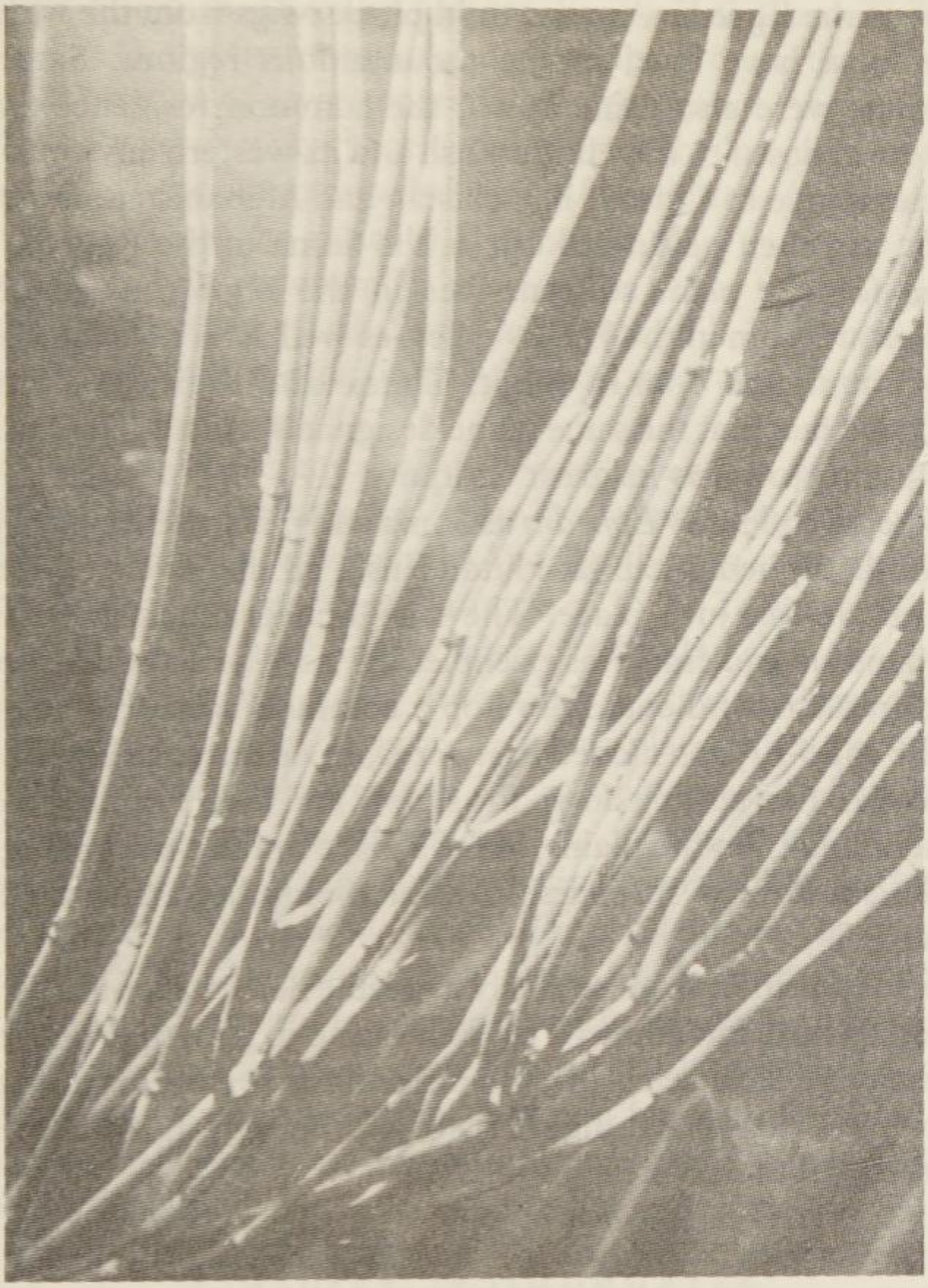


FIG. 2. Dried twigs of Ephedra

E. intermedia and *E. pachyclada*. They all contain Ephedrine. In addition, there is *E. foliata* which grows in the plains of south Punjab and Rajasthan. It does not contain any appreciable quantity of Ephedrine. The rest of India is not the natural habitat of any species of *Ephedra*. Local names of *Ephedra* were recorded a hundred years ago. Thus *E. gerardiana* is called asmania, butshur, budshur and chewa in Punjab; phok in the Satluj valley; tse, tsapatt and trano in Ladhak; and khanda and khama in Kunawar [not identified].[54]

Since the Ṛgvedic Aryans could pluck twigs from the wayside, they must have lived in the mountainous regions. Since the Avestans were also using Soma, the common residence can be narrowed down to the Hindu Kush and its western environs. The species native to Chitral, Baluchistan and Afghanistan, *E. pachyclada*, can then be singled out as the Soma of the Ṛgveda. The name for the plant still survives in the region, as noted by Aitchison: Hum in the Herat Valley, as well as in Baluchi, Pashto and Brahui, and Som in Gilgit, Chitral and Kafiristan. The remarkable fact that the same name designates a plant in a vast area also points towards its great antiquity.

When we identify *Ephedra* as Soma and place the Ṛgvedic people in the Ephedra-habitat Hindu Kush, all the diverse pieces of the puzzle fall into place. The vast Ephedra-growing area in Afghanistan and Iran was occupied by or was accessible to the Indo-Iranians who could develop a common Soma/Haoma cult. As the Indo-Aryans moved eastwards, their distance from Soma increased, first cutting down the supply and then stopping it altogether. Finally, in the plains, Soma's place in the rituals was given to the substitutes. In course of time, Soma became a mythical plant.

In its transition from an easily available herb that could be processed by husband and wife in their home to a myth even for the later-day medical celebrities, Soma records the distance that the Indo-Aryans traversed, figuratively and literally, from the Ṛgvedic times to the classical period.

ASTRONOMICAL EVIDENCE

There is another important piece of evidence that points towards a non-Indian connection of the Ṛgvedic people. It comes from astronomy, and is contained in the ancient Vedic text Vedāṅga Jyotiṣa. This text comes in two recensions: Ṛgvedic and Yajurvedic. The Ṛgvedic recension consists of 36 verses. Thirty of these are repeated in the Yajurvedic recension which in turn contains an additional 13 verses. There are thus in all 49 astronomical verses, some of which have not yet been interpreted. The Ṛgvedic recension is attributed to Lagadha. Vedāṅga Jyotiṣa has been placed at about 1400 BC (chapter 3).

It was noted in 1879 by George Fredrick William Thibaut (1848–1914), the first translator of Vedāṅga Jyotiṣa, that it contains information of great geographical significance. Verses 7 and 22 of the Ṛv version say that the duration of the longest day, that is the day of the summer solstice, is 18 muhūrtas (1 day = 30 muhūratas). Thus the ratio of the longest day to the shortest night is 3:2. This statement is repeated in other texts also, for example in Kauṭilya's Arthaśāstra and Patañjali's Mahābhāṣya.[55] Later, the ratio was spotted in Babylonian cuneiform records dating from about 700 BC.[56]

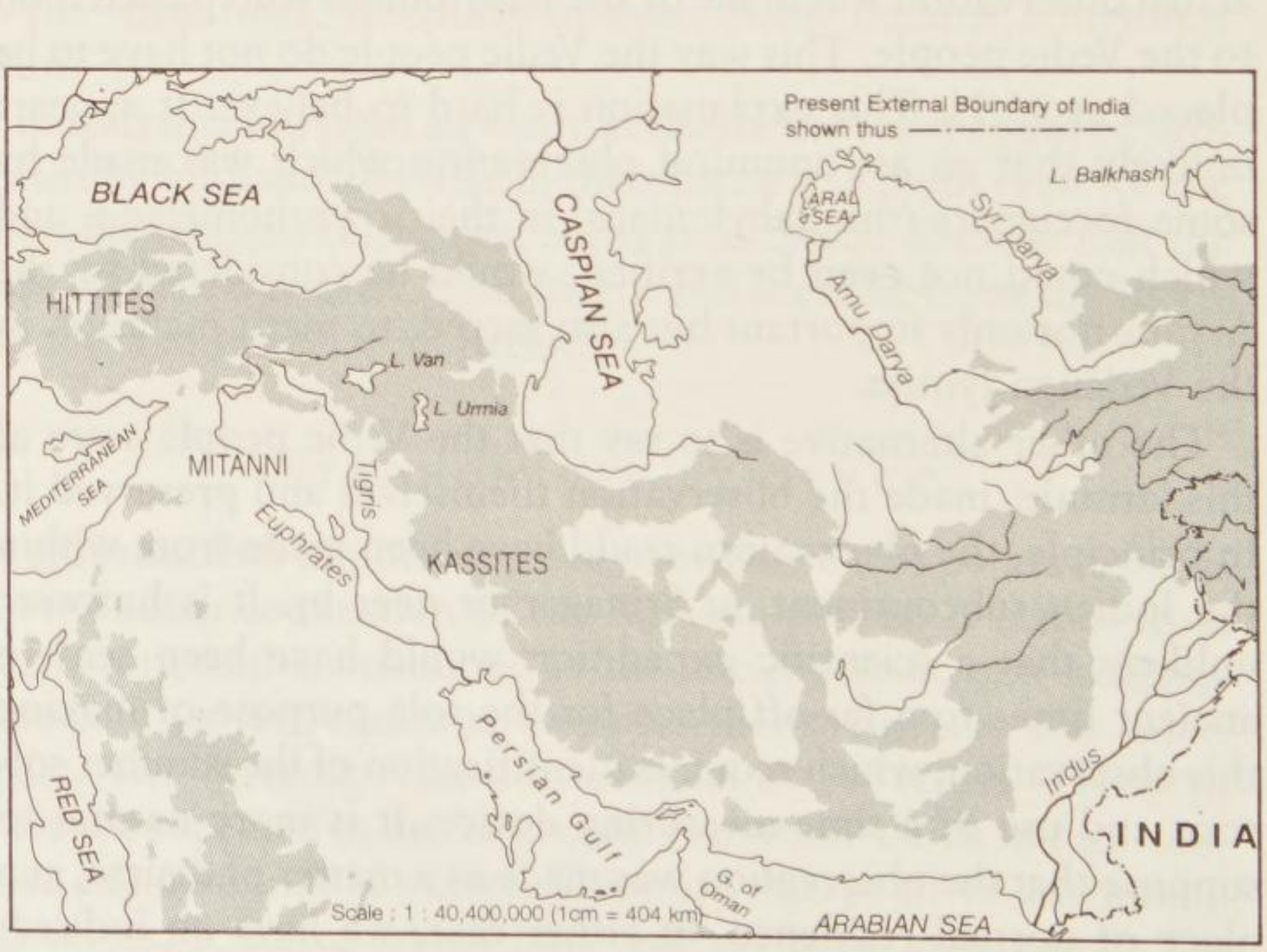
Day and night are equal at the equator, and as one goes to higher latitudes, days become longer in summer. A simple mathematical calculation shows that the Vedāṇga Jyotiṣa statement corresponds to a rather northerly latitude of 35°N. To get an idea of this location, note that Srinagar, Herat and Kabul all are at about 34°N. Making allowances for the margin of error in observations and for simplicity of calculation, any such place will serve as the seat of the recorded observation. There are two ways of explaining the Vedāṅga Jyotiṣa statement. The first is to say that the actual observation was made by the Babylonians who passed it on to the Vedic people. This way the Vedic people do not have to be placed at 35°N. This explanation is hard to believe. It appears unlikely that an astronomical observation which was made by some foreigners (the Babylonians) in their own homeland, and which could not even be verified, would be considered by the Aryans not only important but also sacred, to merit inclusion in the Vedāṅga Jyotiṣa.

The other alternative is to say that the Vedic people were at this latitude, made the observation themselves and preserved it. In principle, the observation could have been made from within the Indian subcontinent, at Srinagar or near by. It is however unlikely that a scientific expedition would have been sent in ancient times to a far-off place for the sole purpose of making this observation, which requires identification of the summer solstice and use of a time-measuring device. It is more natural to suppose that the observation was made as a matter of course, at a place of normal residence. In either case, we have an indirect piece of evidence from the Vedic texts themselves that connects the Aryans with the northerly latitude of 35°N.

WEST ASIAN DOCUMENTS

Conclusive evidence for the migrations of Aryans comes not from India or Iran but from further west, which had a tradition of writing (map 5). Documents of the Kassite dynasty of Babylon (c. 1750–1170 BC) contain Aryan names. The Kassite language has nothing to do with the Aryan or Indo-European language. Nevertheless, in a list of names of gods with Babylonian equivalents there appears a sun god Suriyas which must clearly be identified with the Sanskrit Sūrya. In addition, there is Marutas (the war god), written as En-urta, which can be compared with the Sanskrit Marutta, although the latter always appears in plural. Among the kings of this dynasty, one name can be interpreted as Aryan: Abirattas, that is abhi-ratha, "facing [war] chariots".[57]

The cuneiform documents, in Akkadian, of the Mitanni kingdom (c. 1500–1300 BC) (corresponding to north Syria) contain names of princes which are distinctly Aryan. In the Indo-Aryan form they are as follows: Sutaraṇa, Praśāstṛ, Saukṣatra, Ṛtadhāman, Tviṣratha and Mativāja. Mitanni kings were Aryans, even though their subjects, the Hurrians, were not. In addition, in



MAP 5. The Mitanni and their neighbours
(after Mallory 1989, map 24)

private documents from this area, written in Assyrian, there are a number of proper names of local notables which can be interpreted as Aryan—for example, Ṛtamna, Vārddhāśva, Vīryaśūra, Puruṣa, Kṣemaśūra, Sātavāja. Even in the surrounding territories, as far as Syria and Palestine, a number of rulers had Aryan names: Svardāta, Satvara, Ṛtamanya, Vṛddhāśva, Vīryvāja, Indrota and Subandhu.[58] (The name Indrota occurs in the Ṛgveda also.)

The most important piece of evidence was uncovered from Boghazkoi in 1907, giving a definitiveness to the whole question of the chronology and geography of the Ṛgveda.[59] In about 1350 BC, the Mitanni king Mativaza (son of Tusratta) was defeated by King Suppiluliuma of the Hittites, the creators of the Anatolian civilization (corresponding to the present eastern Turkey). Following the war, a treaty was concluded on cuneiform tablets between the two kings at the Hittite capital Hattusha (modern Boghazkoi). After the terms of the treaty are stated, a prohibition is given against hiding, changing or destroying it. The text continues, "May the gods of the secret and the gods whom we call lords of the oath, whom we are herewith calling, stand by, may they hear and may they be witnesses."

After this, the names of Hittite gods are written. Then there is a break, marked by a dividing line. Then come the names of Mitanni gods. Wedged in between these later gods are the five Aryan divinities: Mitra, Varuṇa, Indra, and the (two) Nāsatyas. (The treaty is in fact in two versions. In the second version, the order of the Hittite and Mitanni gods is inverted.) It is reasonable to suppose that while the other Mitanni gods named in the treaty belong to the Hurrian people, these five are the gods of the ruling nobility. The five Aryan divinities of the Mitanni treaty are Ṛgvedic gods and not Avestan. Indra and the Nāsatyas (also called Aśvins) are gods in the Ṛgveda but demons in the Avesta. No follower of the Avesta could ever swear by them. The name Varuṇa does not appear in the Avesta at all, while Mitra appears as Mithra, generally coupled with Ahura (Asura) in the dual Mithra-Ahura. The dual Mitra-Varuṇa occurs in the Ṛgveda no less than 90 times, but has no linguistic equivalent in the Avesta.

The order in which the divinity names appear in the treaty is significant. Names in the same order also appear in a Ṛgvedic hymn (Ṛv 10.125.1): "I (speech) hold aloft both Mitra and

Varuṇa, Indra-Agni, and both the Aśvins". There are two small variations. In place of Nāsatya, the synonym Aśvin is used. More importantly, instead of Indra it uses the double name Indra-Agni. This variation can be interpreted as a desire on the part of the poet to create a grammatical parallelism between the three members of the group by making them uniformly dual.

The choice of these Ṛgvedic divinities for mention in the treaty is not fortuitous. One of the functions assigned to them by the Ṛgveda deals with treaties. Mitra and Varuṇa "cause people to make mutual agreements" (Ṛv 1.136.3) and "keep in agreement these people and lead them together" (Ṛv 5.65.6). On the face of it, it may appear incongruous that the defeated Mitanni king is swearing by Indra, generally recognized in the Ṛgveda as god of victory. But Indra had another role (Ṛv 10.89.9): "Sharpen thy strong weapon, Indra, against those who do not recognize the sacredness of contracts/treaties, who deceive Mitra, Aryaman and Varuṇa." Why Nāsatyas figure in the treaty becomes clear from the following verse (Ṛv 8.35.12): "You two Aśvins [= Nāsatyas] slay the enemy and keep in agreement those who are connected by a contract/treaty. Bestow upon us progeny and affluence".

To sum up, the divinities would discharge their duties in accordance with their characteristics described in the Ṛgveda: Mitra would watch over the terms of the treaty, Varuṇa over the oaths and both together would persecute the transgressor. Indra would destroy the treaty-breaker and give victory to the party that keeps its promise. The two Nāsatyas would help defeat those who fight against their partners and reward the righteous by giving them progeny and riches.

The conclusion that the Mitanni kings are to be specifically identified with the Ṛgvedic people rather than the Avestan finds support from linguistic arguments as well. Kikkuli's treatise on horse training mentions aika, "one", which corresponds to Sanskrit eka, whereas Iranian has aiva. Likewise, Kikkuli's satta corresponds to the Sanskrit sapta rather than the Iranian hapta or hafta.

Our information about the Mitanni Aryans comes from outside their own kingdom. If one day the Mitanni archives themselves are discovered, we shall have more material on them. The Boghazkoi evidence proves that the Ṛgvedic concepts were

already fully developed in about 1400 BC. Seen in totality, it is unlikely that these concepts would have been carried by the Aryans from India to west Asia. It is more reasonable to suppose that these concepts were developed by them in a central area, from where they travelled towards the west as well as the east.

7

ṚGVEDIC RIVERS

For men may come and men may go,
But I go on for ever.
—Alfred Tennyson, 'The Brook'

If most of the Ṛgvedic hymns were composed in Afghanistan, as we have suggested, then this fact should be borne out by the contents of the Ṛgveda itself. The chief geographical clues in the Ṛgveda are the rivers.[1] Since the identification of the Indus system is not in doubt, it can be used as a benchmark.

INDUS RIVER SYSTEM

The Ṛgveda is familiar with the whole of the Indus river system. It mentions the Punjab rivers. They are from west to east, Vitastā (now Jhelum), Asiknī (Chenab), Paruṣṇī (later called Irāvatī, hence the present name Ravi) and Śutudrī (Satluj). In addition, the western tributaries of the Indus are also mentioned, some of which can be identified. The nadīstuti hymn (Ṛv 10.75.6) says: "First with Triṣṭāma thou art eager to flow forth with Rasā and Susartu, and with Śvetyā here. With Kubhā; and with these, Sindhu! and Mehtanu, thou seekst in thy course Krumu and Gomatī."

Kubhā (Kabul) and Krumu (Kurrum) are easily identified. From the context it is clear that Gomatī is the Gomal in Baluchistan, and not the Gomati of east Uttar Pradesh. This identification is significant because it illustrates the later reuse of a Ṛgvedic name. Clearly, the rivers are enumerated downstream, but it is not possible to identify the others. A small town Matun (69° 57' E, 33° 22' N) south of Kurrum reminds one of Mehtanu. Rasā here is obviously a tributary of the Indus, although at places in the Ṛgveda it denotes a semi-mythical river. Its significance lies in the fact that its homonym Ranha (or Ragha) is a semi-mythical river in the Avesta. Elsewhere (Ṛv 8.19.37), there is mention of

Suvāstu, the Soastos of Arrian, the modern Swat, which is a tributary of the Kabul.

Since most of the rivers are merely named in the Ṛgveda and not discussed, the only clues available for their identification are phonetic. Ṛv (6.27.5) mentions Hariyūpīyā and the next stanza Yāvyavatī. It has been suggested that Hariyūpīyā is River Iryab (Haliab), a tributary of the Kurrum. Yāvyavatī is equated with River Zhob in Baluchistan which receives the Gomal. Yāvyavatī literally means rich in barley, and the Zhob river valley is indeed very fertile. In the absence of any other clue, such identifications can only be tentative. But the fact remains that the Ṛgvedic poets were familiar with the western side of River Indus.

The name Hariyūpīyā has been identified with Harappa. The identification, however, does not prove that Hariyūpīyā was the name of the ancient settlement. We do not know how the Harappans called themselves. The term Melluha used by the Mesopotamians might have been the Harappans' name for themselves, or alternatively a Mesopotamian coinage. It is likely that the ancient Harappan civilization lay quietly buried under the mound on or near which the Ṛgvedic people later built their settlement and gave it a Ṛgvedic name.

SARAYU

The Ṛgvedic Sarayu has been identified with the Sarayu (or Sarju) of east Uttar Pradesh on purely phonetic grounds. The Sarju lies further to the east of the post-Ṛgvedic river Gomati. Now we know from archaeology that east Uttar Pradesh was not inhabited by Indic speakers in Vedic times. This identification therefore can be ruled out. Even in the pre-archaeological era the identification was considered rather unsatisfactory. As already noted, the *Vedic Index* records suggestions that Sarayu be identified with Krumu or with the united course of the Satluj and Beas!

Sarayu is mentioned three times in the Ṛgveda. In one passage, the reference is merely to its crossing and therefore of no help as regards its placement. Ṛv (10.64.9) states, "Let the great streams come hither with their mighty help. Sindhu, Sarasvatī, and Sarayu with waves". Sindhu and Sarasvatī are known to be mighty rivers. The passage tells us that Sarayu is also in the same

league. By no stretch of imagination can the Sarju be considered a large river. It is not even a direct tributary of the Ganga. The Sarju is a minor stream that falls into the Ghaghara (or Gogra) which in turn joins the Ganga.

Furthermore, we have (Ṛv 5.53.9), "So let not Rasā, Krumu or Anitabhā; Kubhā or Sindhu hold you back. Let not the watery Sarayu obstruct your way". This passage suggests that Sarayu is located not far from the upper Indus and its western tributaries. We should therefore look for Sarayu on the western side of the Indus. Accordingly, we identify Ṛgvedic Sarayu with the Avestan Haroyu, the modern Hari-rud (Hari River).[2] The 650 km long Hari-rud rises at an altitude of 2,700 m on the western slopes of the Koh-e Baba Range of the central Hindu Kush Mountains and flows westwards across the broad Herat Valley. It turns north about 130 miles west of Herat and forms the border between Afghanistan and Iran for a distance of 100 km. It then crosses into central Asia, where it is known as the Tedzhen. It finally disappears in the Kara Kum Desert[3] (chapter 8). Both the names Hari and Herat (situated on the banks of the Hari-rud) are derived from Haroyu. Note that the Greek names Aria and Ariana are derived from Haroyu and not Ārya.[4]

SARASVATĪ

The main clue to the geography of the Ṛgveda is provided by the river Sarasvatī on whose banks many hymns were composed and whose name was given to the goddess of learning. We must, however, distinguish between the celebrated Sarasvatī of the old maṇḍalas and the Sarasvatī named in passing in the Indus-centric nadīstuti hymn of the tenth maṇḍala (Ṛv 10.75).

Nadītamā versus Vinaśana Sarasvatī

Sarasvatī has been described in detail in one exclusive hymn (Ṛv 6.61) and in various other passages. It is described in superlatives. It is called nadītamā, "the best of the rivers" (Ṛv 2.41.16), which surpasses "in majesty and might all other rivers" (Ṛv 7.95.2). It is "fierce" (Ṛv 6.62.7) and "swifter than the other rapid streams" (Ṛv 6.61.13). It "comes onward with tempestuous

roar" (Ṛv 6.61.8), "bursting the ridges of the hills with its strong waves" (Ṛv 6.61.2). Sarasvatī springs from a "three-fold source" (Ṛv 6.61.12) in the mountains (Ṛv 7.95.2), and finally ends in a samudra (literally "the gatherer of the waters" or sea) (Ṛv 7.95.2).

Sarasvatī must be a long river because many kings live on its banks (Ṛv 8.21.18) and the five tribes (Ṛv 6.61.12) derive their prosperity from it. It also has a number of tributaries themselves "strongly flowing", with Sarasvatī as the seventh; it is sindhu-mātā, the "mother of rivers" (Ṛv 7.36.6). It swells with rivers (Ṛv 6.52.6), said to be seven in number (Ṛv 6.61.12). Two rivers, Dṛṣadvatī and Āpayā, are explicitly named in Ṛv (3.23.4) in conjunction with Sarasvatī. In addition, it is saptaśvasa, "seven sistered" (Ṛv 6.61.10). Another verse (Ṛv 8.54.4) speaks of Sarasvatī and seven rivers (Sapta Sindhavaḥ). These must be the "seven mighty rivers" that "seek the seas" (Ṛv 1.71.7).

The picture that emerges is as follows: The long and mighty, partly mountainous river Sarasvatī receives a number of tributaries. It is called their mother. In addition, there are independent rivers in the region that go to the sea on their own. Sarasvatī is called their sister. (The number seven may have been used in the sense of an auspicious number rather than in an exact sense.)

So far we have depended only on the Ṛgveda for information on Sarasvatī. We now turn to the secondary Vedic literature for additional details. The Brāhmaṇa and sūtra literature, though linguistically younger, seems to contain material belonging to an earlier era. Pañcaviṃśa Brāhmaṇa (25.10, for example) introduces us to the region Kurukṣetra in which Sarasvatī, Dṛṣadvatī and Āpayā flowed. In it were located the lake and district of Śaryaṇāvant and the district of Ārjīkā mentioned in Ṛv (1.84.14). Another lake, Anyataḥplakṣā, is also placed in Kurukṣetra (Śatapatha Brāhmaṇa 11.5.1.4). The well-respected Baudhāyana Śrautasūtra (18.45) says that in Kurukṣetra there are lotus lakes called Bisvaṭis and 'hills' named Auśānasas. The Śrautasūtras of Āśvalāyana (12.6.1) and Sāṅkhāyana (13.29.24) tell us that the source of river Sarasvatī is a place called Plakṣaprāsravaṇa.

Ṛv (6.61.1) talks of a people Pārāvatas slain by Sarasvatī. These Pārāvatas are placed on river Yamunā by Pañcaviṃśa Brāhmaṇa (9.4.11). Yamunā in turn is associated with Dṛṣadvatī, as can be seen from Lāṭyāyana Śrautasūtra (10.19.8–9): "He should proceed

on the southern bank of Dṛṣadvatī. When he has reached the armaḥ (village) whencefrom she springs, he should offer his offering and descend into Yamunā in the vicinity of the place [called] Triplakṣāvaharaṇa."[5] The above passages suggest that Yamunā is a tributary of Sarasvatī in the hilly areas where Dṛṣadvatī also originates. River Gaṅgā must also be a part of this network as can be seen from the exploits of the celebrated King Bharata, son of Duṣyanta. Bharata won his victories on Sarasvatī (Aitareya Brāhmaṇa 8.23) as well as on Gaṅgā and Yamunā (Śatapatha Brāhmaṇa 13.5.4.11).

The only reference to Gaṅgā in the old maṇḍalas is Ṛv (6.45.31) which mentions the epithet Gāṅgyaḥ. It can be interpreted to mean the man Urukakṣa who was son of a woman named Gaṅgā, or who lived on a river named Gaṅgā. Alternatively, it could mean a broad thicket on the river called Gaṅgā. If Gaṅgā in this family maṇḍala refers to the river, it must be the Gaṅgā associated with the nadītamā Sarasvatī. Gaṅgā is not mentioned in any other Veda.

The connection between Gaṅgā and Sarasvatī is more explicitly stated in the tertiary literature, that is the Purāṇas and the epics. Rāmāyaṇa (Ayodhyā.65.5) tells that while returning from Kekaya to Ayodhyā, Bharata crossed the confluence of Gaṅgā and Sarasvatī. Mahābhārata Vāṇaparvan (84.38; 88.176, 201) mentions this confluence and names a sacred place Gaṅgāharda, "the tank of Gaṅgā", in Kurukṣetra. In a similar manner, Vāmana Purāṇa (13.6–7; 15.62) lists Gaṅgā as one of the rivers of Kurukṣetra and mentions the sacred places Kṛtajapya and Kotitīrtha on it.[6]

Thus we have a persistent tradition right from the older maṇḍalas of the Ṛgveda down to the epics which calls Sarasvatī a mighty river and associates it with Dṛṣadvatī, Gaṅgā and Yamunā. Let us call it the *nadītamā* Sarasvatī. But on the other hand, the later Vedic texts contain descriptions that are inconsistent with the above. Pañcaviṃśa Brāhmaṇa (25.10.1), Jaiminīya Upaniṣad Brāhmaṇa (4.26.12) and the associated Śrautasūtras say that Sarasvatī disappears in the desert sands at a place called Vinaśana (literally disappearance). Let us call this weakling river *Vinaśana* Sarasvatī.

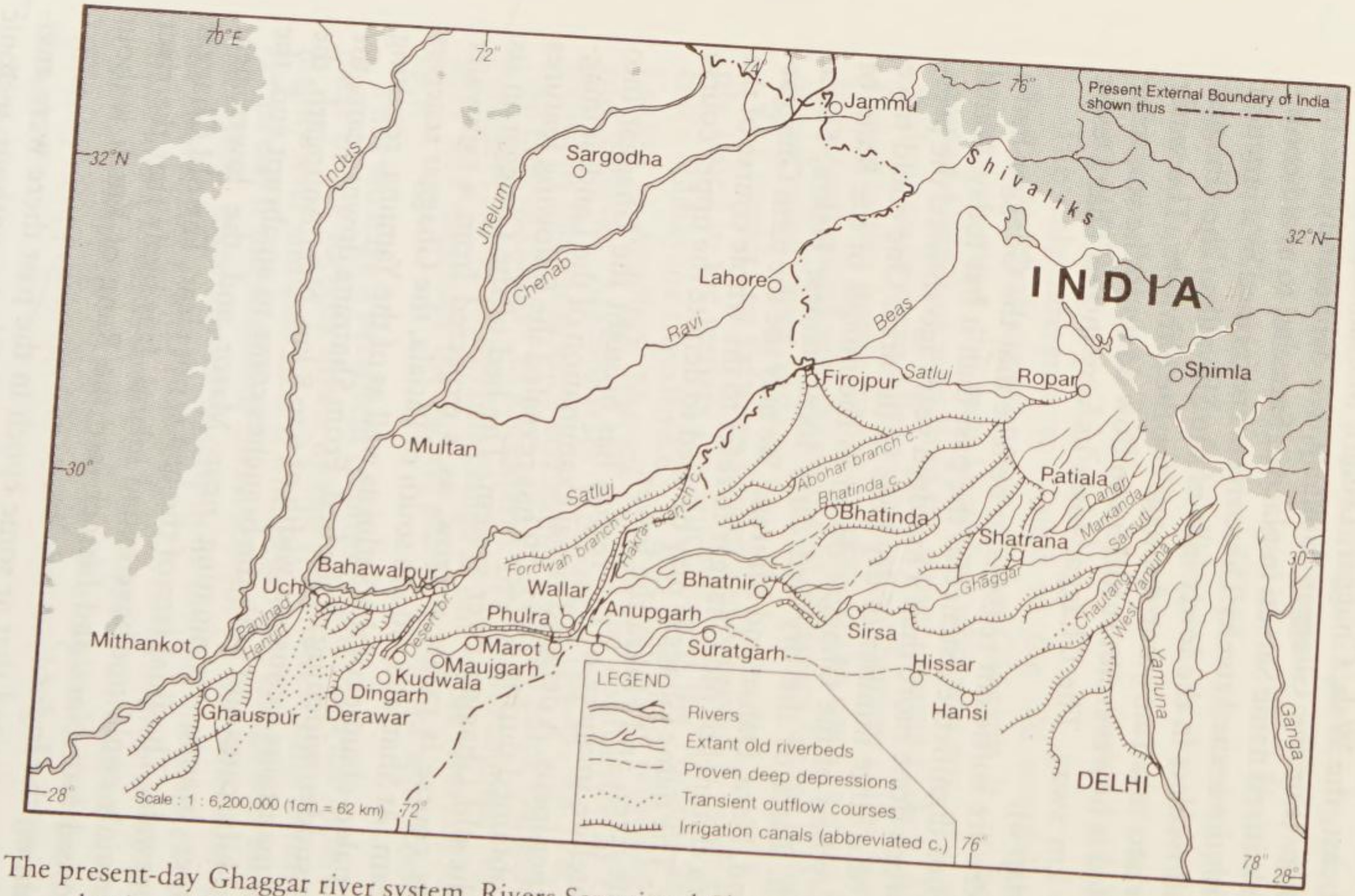
Identification of nadītamā Sarasvatī is made difficult by the known fickleness of the Himalayan rivers and the vast artificial

irrigation network in the alluvial plain. There lies between the Satluj and Yamuna, the Ghaggar river system consisting of, from west to east, the Wah, Ghaggar, Dangri, Markanda, Sarsuti and Chautang. (For the Ghaggar tributary, we deliberately use the de-Sanskritized name Sarsuti in place of Sarasvatī to avoid confusion with the textual river.) These rivers are formed by a junction of small rivulets in the lowly hills of the Shivaliks. The Ghaggar system acts as a rainwater drainage for the Shivaliks. The water collected is however not sufficient to flow down to the sea, some 1,400 km away. The Ghaggar loses its way in the Thar Desert (see map 6).

There are sufficient reasons to believe that the Ghaggar had a far more dignified existence in the past than it has today. Actual fieldwork done more than a hundred years ago showed the presence of a large number of dry beds in the area. One could trace the dry bed of the Ghaggar down to the mouth of the Rann of Kutch. Parts of the dry bed carry local names: Hakra, Sotra, Whind, Nara, Dahan and Mihran.[7] We may use the term Ghaggar-Hakra channel or old Ghaggar to refer to the whole course of the river. The name Ghaggar may be used to denote the upper course of the river, and Hakra the lower.

Satellite imagery of the region has brought the Ghaggar into sharper focus. A detailed visual examination of the Landsat imagery obtained during 1972–79 has revealed the following features of the old Ghaggar river system. The bed of the Ghaggar in its early course is rather narrow, as is expected from a rainwater stream. At Shatrana, 60 km south of Patiala, the Ghaggar receives the paleo-channel of the Satluj as well as of the Yamuna, resulting in a sudden widening of the bed. From Shatrana downstream, the bed maintains a constant width of 6 to 8 km. Near Anupgarh, the bed bifurcates and both the branches come to an abrupt end, the upper branch terminating near Marot and the lower near Berewala. The final fate of the bed is not clear. The old Ghaggar certainly could not have ended inland. It is likely that the river flowed into Nara and further into the Rann of Kutch without joining the Indus.

It is surmised that at some epoch in the past there were environmental and geological changes (with or without tectonic movements) which diverted the Satluj westwards into the Indus,



MAP 6. The present-day Ghaggar river system. Rivers Sarsuti and Chautang as well as man-made canals use channels vacated by the old Yamuna and the old Satluj during successive migrations (after Wilhelmy 1969, fig. 3)

and the Yamuna eastwards into the Ganga. Between the Ghaggar and the present-day Satluj, there are a number of braids which probably are a result of the upheaval. The Yamuna's shifting seems to have been in well-recognized stages. One can see in the satellite images a paleo-channel, named Y1, which joined the old Ghaggar bed near Shatrana. There is another paleo-channel, Y2, through which the Yamuna later flowed. This joined the Ghaggar lower down near Suratgarh. The third paleo-channel, Y3, deposited the Yamuna into the Chambal which in turn flowed into the Ganga. Finally, there came the present stage when the Yamuna became a direct tributary of the Ganga. The present-day Sarsuti flows through the old channel Y1, while Y2 corresponds to the Chautang.[8] It is important to keep in mind that satellite imagery provides a wide-angle snapshot of the region. It tells us about the old channels of rivers but cannot tell us when these channels were abandoned.

It has implicitly been assumed that changes in the fortunes of the Ghaggar took place during the Vedic times. It has been part of received wisdom for many generations that the Ghaggar is identical with the Sarasvatī of the literary texts: the old Ghaggar is equated with the mighty Ṛgvedic Sarasvatī, and the present-day Ghaggar with the weaker Sarasvatī of the later texts. Very often, even scholarly publications use the literary terms Sarasvatī and Dṛṣadvatī as if they were present-day geographical names. This causes confusion, the more so because Sarasvati (Sarsuti) is an existing river. More importantly, this obliterates the vital distinction between hypothesis and fact.

On first appearance, the identification of the nadītamā Sarasvatī with old Ghaggar looks plausible. In fact, any long river which goes from the mountain to the sea and receives tributaries on its way can fit the general description of the Ṛgvedic Sarasvatī. It has indeed been suggested, with all seriousness, that in some Ṛgvedic passages, Sarasvatī is another name for Indus![9] If an identification is to be acceptable, it should not be superficial, but should conform to the recorded description down to the minutest detail. We now present arguments to show that the old Ghaggar cannot match the attributes of the Ṛgvedic Sarasvatī. The two major arguments are as follows:

i. The assumption that confluence with the Satluj and the Yamuna would have made the Ghaggar a mighty river cannot

stand close scrutiny. The confluence would affect the Hakra part of the Ghaggar-Hakra channel, not the Ghaggar part. The inflow of water from the two snow-fed rivers would make the Hakra part affluent. From its origin in the Shivaliks up to the confluence, however, the basic character of the Ghaggar would not change. It would still be a rainwater stream in low hills, whose height seldom exceeds 1,300 m. The Ṛgvedic description of Sarasvatī as a mighty, swift river that cuts the ridges of the hills does not fit the Ghaggar of today. It would have neither fitted the Ghaggar of the past.

According to the Ṛgveda, even the tributaries of Sarasvatī were "strongly flowing" rivers. This cannot be said of the puny rivers that join the Ghaggar.

ii. The biggest argument against the old Ghaggar's being the nadītamā Sarasvatī comes from the position of the Satluj. If the old Ghaggar is to be a mighty river, it must receive the Satluj. In the Ṛgveda, however, there is no suggestion whatever that Śutudrī (Satluj) was in any way connected with Sarasvatī. As a matter of fact, the Ṛgveda explicitly associates Śutudrī with Vipāś (Beas) and refers to their confluence.

Ṛv (3.33) describes a dialogue between Viśvāmitra, on the one hand, and the rivers Vipāś and Śutudrī, on the other. Viśvāmitra accompanied by the Bharatas addresses the two rivers: "Forth from the bosom of the mountains ... Vipāś and Śutudrī speed down their waters [and] impelled by Indra ... move as it were on chariots to the ocean". He says about Vipāś, "I have attained the most maternal river; we have approached Vipāś, the broad, the blessed." He requests the two rivers thus, "Listen quickly, Sisters, to the bard who cometh to you from far away with car and wagon. Bow lowly down; be easy to be traversed: stay, Rivers, with your floods below our axles." The rivers acceded to Viśvāmitra's request, because we are told, "The warrior hosts, the Bharatas, fared over: the singer won the favour of the Rivers."

We learn a number of things from this hymn. If Viśvāmitra arrived there with car and wagon, it must be the entourage's first crossing of the rivers. Significantly, Viśvāmitra addresses Vipāś first, implying that he was parked to its west. There is however a curious element. If Viśvāmitra was crossing the rivers for the first time, how did he know that the two waters reach the ocean? The

poem must therefore have been composed in commemoration of the event. The most important point for our present purposes is undoubtedly the documentary evidence that in the Ṛgvedic times, the Satluj joined the Beas and flowed into the ocean.

Interestingly, the Mahābhārata (Ādiparvan 167.8) narrates a legend that when ṛṣi Vasiṣṭha threw himself into Satluj with a view to committing suicide, the river broke into a hundred channels. This cannot be treated as a contemporaneous account of the Satluj's shifting its course. A simple interpretation of the legend would be that dry channels east of the Satluj were generally noticed and correctly associated with the river. From this, a story was made to enhance the prestige of Vasiṣṭha. Since in real life the Satluj is unlikely to have obliged Vasiṣṭha, the prior existence of the dry channels was necessary for making up the legend.[10]

There are other arguments as well:

iii. In the Shivaliks all rivers, whom we may call Ghaggarettes, are alike. There is no reason to single out any one of them as the foremost.

iv. It is strange that a river system containing such majestic rivers as the Satluj and Yamuna should be known by the name of a puny rainwater stream such as Ghaggar. In the Vedic literature, Yamunā is clearly subservient to Sarasvatī. This is contrary to the arrangement in the old Ghaggar system, where the Yamuna along with the Satluj would have been dominant.

v. The secondary Vedic tradition associates not only Yamunā but also Gaṅgā with Sarasvatī. By no stretch of imagination can the present-day Ganga be associated with the Ghaggar, leave aside in a subsidiary capacity.

vi. When Sarasvatī is equated with the Ghaggar, the Chautang is designated Dṛṣadvatī on plausibility arguments. As already noted, a ṛṣi in Lāṭyāyana Śrautasūtra (10.19.8–9) can go to the source of Dṛṣadvatī and casually move over to Yamunā. This is not possible in the Ghaggar set-up, because the source of the Yamuna is not at walking distance from the Chautang. The Yamuna rises in the middle Himalayas, from the Yamunotri Glacier on the Bandar-punch ("monkey's tail") peak in Garhwal, at a short distance from the birthplace of the Bhagirathi (which combines with the Alakananda to form the Ganga).

vii. It is implicitly assumed that even when the Yamuna and Satluj flowed into the Ghaggar, rivers like the Chautang would

have been intact. This assumption does not seem to be valid. At present, the Sarsuti and Chautang both flow in channels vacated by the old Yamuna. This means that when the Yamuna itself was flowing in these channels, these rivers probably did not exist.

viii. In the region of the Ṛgvedic Sarasvatī, there are other sisterly rivers which independently go to the sea. This condition is not fulfilled by the Ghaggar region. Rivers to its east join the Ganga, those to the west the Indus.

ix. The ancient Kurukṣetra appears to be a vast area. It contains not only Sarasvatī, Dṛṣadvatī and Āpayā but many lakes and hills and probably other rivers as well. The hilly extent of the Ghaggar system is very small and devoid of lakes.

x. Later texts say that Vinaśana, where Sarasvatī disappears in the sands, was the western boundary of the Āryavarta. In contrast, the Ṛgveda says that Sarasvatī reaches the sea. It would thus seem that while the Ṛgvedic people felt at home along the entire course of Sarasvatī right up to the sea, their later-day successors confined themselves only up to Vinaśana. This is curious because one expects territory to expand with time rather than shrink, unless there is a natural calamity or defeat at the hands of an enemy.

xi. It is an accepted fact that the Sarasvatī hymns in the Ṛgveda are older than or contempraneous with the Indus hymns. If this Sarasvatī were identical with the Ghaggar, then the archaeological sites on the Ghaggar should have been at least as old as the Punjab-Sind sites. What is observed is otherwise. In the Indian subcontinent, western settlements are invariably earlier than the eastern ones (chapters 5 and 9).

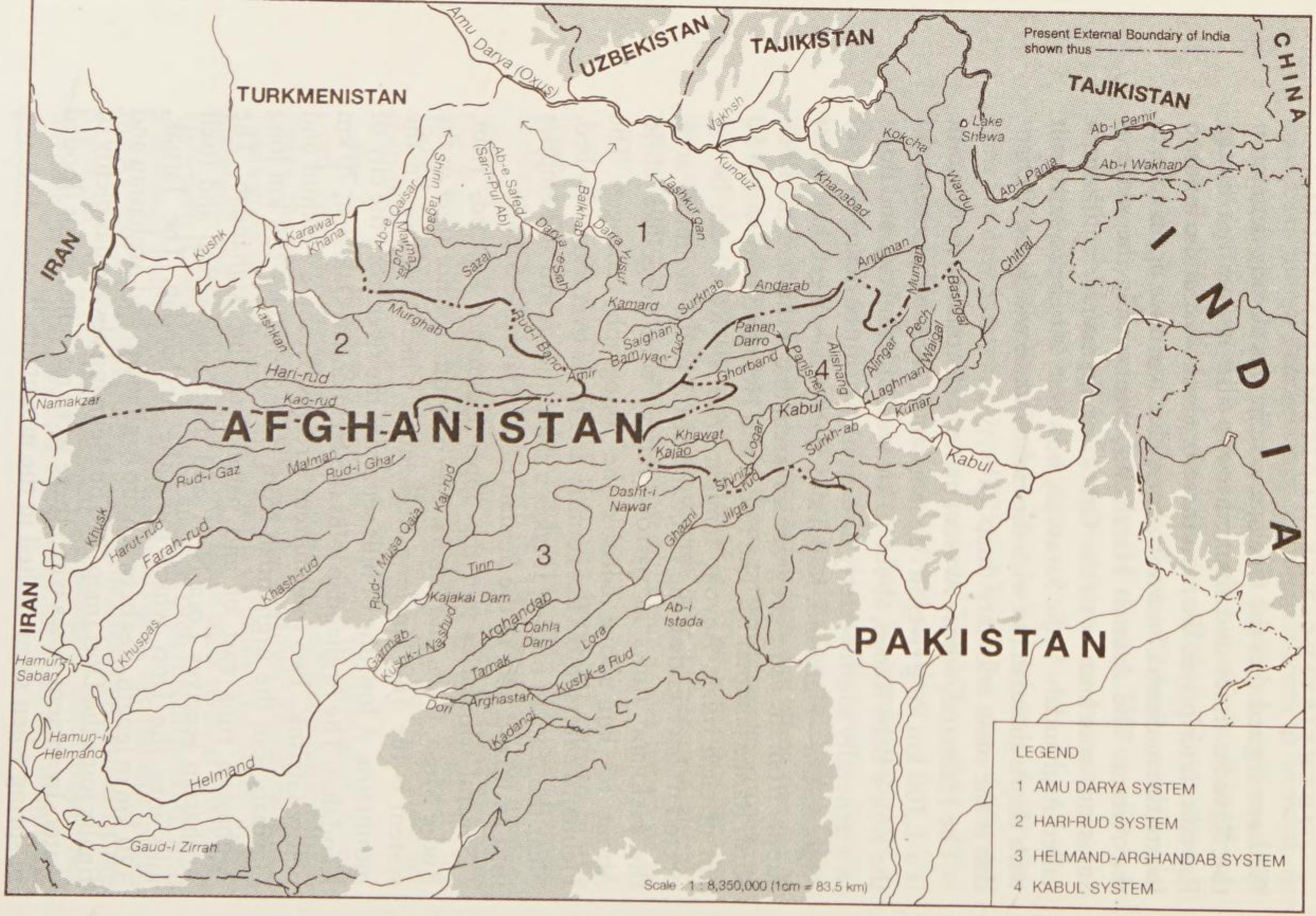
xii. A very important diagnostic seems to have gone unnoticed. Even when the Ṛgvedic locale moved from Sarasvatī to Indus, the importance of Soma did not diminish. This means that Soma grew in both the locales. This is certainly true of the upper Helmand and middle Indus, which share their natural environs. However, if Sarasvatī were the Ghaggar, then it is difficult to find a common plant growing in the hilly areas of the middle Indus, the Avestan lands and on the lower Shivaliks, that would fit the Soma bill. Also, if Soma grew on the Ghaggar, there would not have been any need to find substitutes for it in the Brāhmaṇa period.

IDENTIFYING THE NADĪTAMĀ SARASVATĪ

We have argued that the Ghaggar system was already defunct in the Ṛgvedic times and that otherwise also it does not fit the Ṛgvedic description. We must therefore look west of the Indus to locate the nadītamā Sarasvatī. For a clue, we once again turn to the Avesta. The Avestan Harahvaiti, phonetically the same as Sarasvatī, was known to the Greeks as Etymander and is now called Arghandab. Vedic Sarasvatī, however, is to be equated not with the Arghandab but with the Helmand, of which the Arghandab is the main tributary (map 7).[11]

The Helmand, whose Avestan name is Haetumant (Setumant), is a 1,300 km long river in Afghanistan. It rises in the recesses of the Koh-e Baba Range, about 80 km west of Kabul city, and flows in a generally southwesterly direction. (The three major rivers of Afghanistan—Helmand, Kabul and Hari-rud—all get their water supply from the same geographical area, that is the central Hindu Kush Range [chapter 8]. The Kabul and Helmand start within 50 km of each other. Anyone familiar with the Kabul can be expected to have known the Helmand also.) In the mountain area, the Helmand flows in narrow valleys with gorge-like cliffs. About 65 km above Girishk the topography changes. The Helmand enters into a flat country and flows over a gravelly bed. Near the Iranian border, it takes a sharp turn north and empties into an inland lake in the Seistan called Hamun-e Sabari.

Several tributaries join the upper Helmand: Kaj-rud, Tirin, Rud-e Musa, Gala, and others. The only other major river in the system is the 560 km long Arghandab which also rises in the mountains. A low line of hills separates the river from the city of Kandahar. The Arghandab joins the Helmand at Qala Bist, 70 km below Girishk. Two intermittent streams, Kushk-e Nakhud and Garmab, join the Arghandab from the north. The 280 km long Arghastan runs east of and parallel to the Arghandab. The Arghastan receives Lora No.1 and the Kushk-e Rud and itself falls into the Dori which joins the Arghandab. The Tarnak, 320 km in length, lies between the Arghandab and Arghastan and finally joins the Dori (map 7). The Helmand always has plenty of water. In ancient times when there were no dams, it got flooded in spring when snow melted in the mountains.[12]



MAP 7. Rivers of Afghanistan (after Dupree 1980, p. 32)

There is an uncanny similarity between the Ṛgvedic description of Sarasvatī and the Avestan description of Helmand. Ṛv (6.61.8) talks of Sarasvatī "whose limitless unbroken flood, swift moving with a rapid rush, comes onward with tempestuous roar", while Yasht (10.67) refers to "the bountiful, glorious Haetumant swelling its white waves rolling down its copious floods".[13] This suggests that the same river is meant in both the cases.

Significantly, there are a couple of Purāṇic accounts that match the Seistan locale. It is said that an early Ikṣvāku king, Kuvalāśva, killed a Rākṣasa named Dhundhu near a sand-filled sea called Ujjālaka. More specifically, Viśvāmitra is said to have attained brahmanhood at Ruṣaṅgu's tīrth that is described as being on the bank of river Sarasvatī and in the lowlands near the sea ("sāgaranūpe").[14]

If we identify the nadītamā Sarasvatī with the Helmand, we can consistently account for all its attributes. Sarasvatī, the mother of its tributaries, would be the sister of other independent rivers in the region like the Farah-rud and Fradath-rud. The Arghandab can be equated with Dṛṣadvatī and, say, the Tarnak with Āpayā. There have already been suggestions that Ārjīkīyā be identified with the Arghastan. Lakes like Śaryaṇāvant and Anyatahplakṣā can easily be placed in the hilly areas of Koh-e Baba from where the Helmand starts. The place name Girishk in the region is probably an old name connected with Giri, the mountain. (The Ṛgveda names a person Girikṣit.) In this picture, the original Gaṅgā and Yamunā are the tributaries of the Helmand lying between the Helmand and Arghandab. It is now easy to understand the association of Pārāvatas, the mountain people, with Yamunā and Sarasvatī. These Pārāvatas are probably related to the people called Paroyetai mentioned by Ptolemy and believed to be located near the southern border of Paropamisadae (Kabul).[15]

A number of rivers figure in the exploits of King Sudās. Ṛv (7.18) mentions his victory first on Paruṣṇī (Ravi) and then on Yamunā. The hymn closes with a reference to seven rivers. Since the closing part of the hymn is a dānastuti, it appears likely that the hymn is a summary of Sudās's career, with Ravi and Yamunā figuring in two different campaigns. From the text, it is not clear which campaign is older. According to Pargiter, Sudās first

defeated the Puru king Saṃvaraṇa on Yamunā, and then him and others in the so-called battle of ten kings on Ravi.[16] We have already seen Sudās at the confluence of Vipāś (Beas) and Śutudrī (Satluj).

There can thus be no doubt that Sudās was familiar with Punjab. The Yamunā of his exploits is likely to be a tributary of the Helmand. In that case, his area of operation remains compact and archaeologically plausible. Furthermore, all the participants in the celebrated battle of ten kings would have been located near the war theatre itself. Indeed, according to the Purāṇas, Saṃvaraṇa's ally Druhyu is placed in Gāndhāra and Saṃvaraṇa took shelter near Indus for many years.[17] The Purāṇas and the Mahābhārata, however, generally assign to the ten kings, territories their tribes came to occupy all over India a thousand years later, thus transforming the historical battle into an improbable event.

GHAGGAR AS VINAŚANA SARASVATĪ

Moving eastwards from the Helmand region, the Ṛgvedic people would have found the Indus mightier than any river they had seen before. So, they simply named it Sindhu, the River. Further east, they would have found the Ghaggar system in more or less the same state as it is today. On one of its rivers was bestowed the name and the sanctity of the old Sarasvatī, while names like Dṛṣadvatī and Āpayā were ignored. On reaching the Ganga, they would have given it the name that hardly had any connotation in the old maṇḍalas. Yamunā (the twin) was then a natural name for its chief tributary. This implies naming the Ganga first, even though the Yamuna was crossed first.

It is at this stage that the nadīstuti hymn (Ṛv 10.75) would have been composed. In this hymn, the pride of place belongs to the river Indus to which all the epithets of the nadītamā Sarasvatī are transferred. The Sarasvatī mentioned in this hymn must then be the Vinaśana Sarasvatī, and Gaṅgā and Yamunā the present-day rivers. It is significant that this hymn makes no mention of Dṛṣadvatī and Āpayā, implying their abandonment.

In its upper course, the Vinaśana Sarasvatī is more likely to be the present-day Sarsuti rather than the Ghaggar (map 6). For one, the name is the same. There are in fact four neighbouring

Shivalik streams all carrying the name Sarsuti. The local tradition holds the easternmost one, emerging from Adi Badri, to be the most sacred. Secondly, more sites with ancient names are associated with it than any of its neighbours. Examples are Kapalmochan, Thanesar (Sthaneśvara), Kurukshetra, Pehoa (Pṛthudaka), and Bahar-Jakh (named after Yaksa).[18] Interestingly, no other river of the system carries a Ṛgvedic name. There is a remarkable coincidence whose full significance is not yet clear. Both the Sarsuti of Haryana and the Sarju of eastern Uttar Pradesh are named after Ṛgvedic rivers, and both fall into rivers with similar names, Ghaggar/Ghoghra.

Vinaśana marked the western boundary of the Āryavarta or Madhyadeśa. The tribes living beyond it were called Śūdras, Ābhīras and Niṣādas. (The very concept of a boundary in the middle of the country suggests recent arrival.) Vinaśana was considered a sacred place. Its new-found sanctity coincided with the increasing mythification of the old Sarasvatī. Thus Pañcaviṁśa Brāhmaṇa (25.10.1–23) places Plakṣaprāsravaṇa (Sarasvatī's source) at a distance of 40 āśvinas from Vinaśana.

An āśvina was the distance a horse could cover in a day and equalled five yojanas according to Atharvaveda (6.131.3). A yojana in turn was made of four krośas and corresponded to about 14 km. Plakṣaprāsravaṇa was thus located at a large distance of about 2,800 km.[19] The exact figure is probably not significant. What is significant is the fact that the place was for all practical purposes inaccessible. No wonder then, many legends and myths were built around it. Mārkaṇḍeya Purāṇa (23.28) calls it Plakṣāvataraṇa, a place of pilgrimage on Sarasvatī in the Himavat mountain where the Naga king Aśvatara repaired to propitiate goddess Sarasvatī. In the Mahābhārata Ādiparvan (169.20), Sarasvatī is called Plakṣajātā (born in a fig tree), while Vāṇaparvan (84.4–7) is more ingenuous; the water of Sarasvatī is described as coming out of an ant-hill.[20]

Mahābhārata Śalyaparvan (38) says that there are seven rivers in the world known as Sarasvatī: *(i)* Suprabhā near Puṣkara, *(ii)* Kañcākṣī in the Naimiṣa forest, *(iii)* Viśālā near Gayā, *(iv)* Manorama in north Kosala, *(v)* Oghavatī in Kurukṣetra, *(vi)* Sureṇu near the source of Gaṅgā, and *(vii)* the Vimalodaka in the Himavat forest. These seven are said to unite at Sapta Sārasvat.[21]

This geographical absurdity must be considered significant because it points towards a realization that the location and characteristics of Vinaśana Sarasvatī were not capable of satisfactorily explaining the various references in the corpus of the sacred literature. Bhāgavata Purāṇa (4.19.1) and Vāmana Purāṇa Saromāhātmya (SM) (21.19) explicitly call the Vinaśana Sarasvatī, Prācī (eastern) Sarasvatī implying the existence of one in the west. (The Pehoa inscription of King Bhoja I of the Pratihāra dynasty [ninth century AD] makes a reference to Prācī Sarasvatī.)[22] Vāmana SM (37.60–61) says that Gomatī joins Sarasvatī,[23] apparently not aware that in the Ṛgveda, Gomatī is associated with Indus. It would thus appear that since the Vedic people had moved away for good from the regions where these rivers flowed, their geographical description became creative rather than factual.

As the centre of the Aryan activity moved east of the Yamuna, even the Vinaśana Sarasvatī was forgotten. As a mark of respect to the old Sarasvatī, it was made into an invisible river that joined the Ganga and Yamuna. Thus, in its transition from the nadītamā to the Vinaśana to a mythical river, Sarasvatī like Soma traces the stepwise history of the Indo-Aryan migration from Afghanistan to the Ganga Plain.

HARAPPANS ON THE GHAGGAR

The Ghaggar is important not only from the Vedic point of view but also from the Harappan. The Ghaggar was the lifeline of the Harappans. Of a sample of about 1,400 Harappan sites, more than 75 per cent are situated on the banks of the Ghaggar-Hakra channel. The older sites corresponding to the early Harappan and mature Harappan periods are located on the lower part of the Ghaggar-Hakra (chapter 5), whereas the late Harappan sites are mainly found on the minor rivers in the Shivalik Hills. An in-depth study of the sites suggests that this upstream migration took place in c. 1700 BC.[24]

It is certain that the settlements on the lower course of the Ghaggar-Hakra River could not have been sustained at the present level of water supply. The river, therefore, must have been more watery in the past. The question is: how much more? The

Harappan settlement pattern on the lower Ghaggar has been cited as a proof that the Yamuna and Satluj flowed into the Ghaggar.[25] Such a conclusion is unwarranted. What the Harappans required from the Ghaggar was running water and not the combined might of two snow-fed rivers. Abundant rainfall, and/or the overflow of the Satluj floodwaters into the old channels, would have probably met the requirements of the various Harappan-phase settlements on the Hakra. Alternatively, a small natural (or man-made?) duct transferring some water from the Satluj into the Hakra would have served the purpose. It is noteworthy that the Hakra settlements occupied slightly different geographical areas at different times, implying an erratic water supply.[26]

It is very likely that a mighty Ghaggar would have precluded the appearance of chalcolithic settlements on its banks. Suppose for a moment that the Satluj and Yamuna were flowing into the Hakra in the Harappan times. When the two rivers changed course, we would have expected the Harappans to shift residence to the new banks of the two rivers. The Harappans did not do this but moved northwards to settle on the rainwater streams of the Shivaliks. It is noteworthy that the Harappans did not settle on the upper Indus and its eastern tributaries[27] whose character as snow-fed rivers is similar to that of the Satluj or Yamuna. This suggests that the technologically-restricted Harappans had consciously avoided the snow-fed rivers and that the Hakra they knew was not a mighty river.

A study of the geological processes permits us to draw some conclusions about the life history of major rivers. During a glacial period, a large mass of water gets locked up in glaciers and ice caps, with the result that the sea level falls. It has been estimated that about 20,000 years ago, the sea level was about 100 m lower than it is now. As the climate got warmer the snow melted, raising the sea level. About 6,000 years ago, the sea level stood 5–10 m above the present level.

Since water is transported from the mountain top to the sea by rivers, climatic changes can be discerned in the rivers also. When the sea level is low, rivers cut deep valleys. And since there is much water to be brought down, rivers carry more water, making the deep valleys broad. Additionally, the river channels meander

and the sand deposits are finer. As the sea level rises in the post-glacial period, rivers have to learn to respond to the change. It follows from the laws of physics that the river valleys cannot be deeper than the sea level. Rivers, therefore, tend to fill their valleys with sediments; the process is known as aggregation. With a decrease in water supply, river channels become braided rather than meandering and sand deposits become coarser. Smaller rivers on their part may even fail to cope with the combination of diminished water supply and rising sea level, and simply dry up.

Detailed studies carried out in the Yamuna-Ganga (Yaga) Plain show that all the rivers are well entrenched in their valleys which they have been continuously filling up. It has been guesstimated that for the last 20,000 years, there has been no significant change in the course of the Ganga and by implication the Yamuna. In other words, if the Yamuna flowed into the Ghaggar, it must have been earlier than about 20,000 years ago.[28]

A preliminary study of the Ghaggar's hydrology was carried out during 1983–87 by an Indo-French team. An intricate analysis of solid samples and water-flow patterns suggested that the present water-deficient state of the Ghaggar has been in existence for "some tens of thousands of years".[29] This conclusion has not found general acceptance, because it does not seem to be consistent with the observed high incidence of Harappan sites on the lower Ghaggar.

CLIMATIC CHANGES

Recent studies have shown that the world's climate has not remained the same but has undergone cyclic changes. The ancient climate of the Thar Desert has been reconstructed by analysing pollen scooped from different layers of sediment at the bottom of the saline lakes Sambhar, Lun-karan-sar and Didwana. Studies show that the rainfall was particularly heavy in the period c. 4000–3000 BC. In about 2000 BC or slightly later, there began a long drought lasting a few hundred years.[30] There is similar evidence from the Western Ghats[31] and the Nilgiri Hills,[32] indicating that the aridity extended over the whole of India. It has been suggested that similar conditions prevailed in central Asia also.[33]

It is surmised that during this dry phase, the Ghaggar ceased to be a perennial river. Its bed was choked with sand, so that the

lower part of the channel became incapacitated forever. The drying up of the lower Ghaggar would have compelled the settlers to move upstream. There are indications of water-induced migrations in south Turkmenistan as well (chapter 8).

In passing we may note that the Ṛgvedic eyewitness account (Ṛv 3.33) of Satluj's being a part of the Indus system can be approximately dated with the help of Purāṇic genealogies. According to Yāska, Viśvāmitra's patron in this hymn was Sudās, who is placed three generations after Rāma[34] or at about 1400 BC. At this time, the Satluj-less Ghaggar could not have been a mighty river. This is consistent with the archaeological evidence that the Hakra was waterless in c. 1700 BC. It is comforting to note that the much-maligned Purāṇas provide a date which is consistent with the archaeologically determined chronology.

The identification of the nadītamā Sarasvatī with old Ghaggar was first proposed at a time when the Harappan civilization had not yet been discovered. However, if this identification is to be defended now, the archaeological evidence must be taken into account. From the late-Harappan evidence it is clear that the Ghaggar could have been a mighty river only before 1700 BC. If it was then the nadītamā Sarasvatī, then all the settlements on its banks must have been Aryan settlements. In other words, if the Ghaggar is equated with the Ṛgvedic Sarasvatī, then the Harappans must be equated with the Ṛgvedic people.

The corollary turns out to be more significant than the main theorem. If the Harappans and the Ṛgvedic people are to be identified as one, then we must construct a cultural continuum that *(i)* extends from the neolithic through the chalcolithic to the Iron Age, and which *(ii)* not only accounts for the various phases of the Harappan tradition but also incorporates in it the Indo-European, Indo-Iranian and Indo-Aryan linguistic and mythological traditions. On the face of it, this does not seem to be a trivial task (chapter 9). Therefore, if the identification of nadītamā Sarasvatī with the old Ghaggar is to be considered a plausible hypothesis, it must be presented not in isolation but in the context of the Harappan and Indo-Iranian traditions.

To sum up,[35] the available literary and scientific data suggest the following hypotheses:

i. The stage when the Satluj and Yamuna flowed into the Ghaggar was long over before the Harappan times.

ii. During the early and mature Harappan periods, the Ghaggar-Hakra channel was perhaps perennial or nearly so, to be able to sustain population groups on its lower course.

iii. In about 1700 BC, the water supply diminished further, desiccating the lower part of the Ghaggar channel and forcing the later-period Harappans to migrate upstream to the Shivalik region.

iv. In about 1400 BC there arrived, from the northwest, the Ṛgvedic people who gave to the upper course of the Ghaggar the name (Vinaśana) Sarasvatī after the nadītamā Sarasvatī (Helmand) they had left behind in Afghanistan.

The key to India's prehistory lies in the hydrological history of the Ghaggar. Suppose it turns out that the Ghaggar was a powerful river in 2000 BC. By itself this would not prove that the old Ghaggar was the Ṛgvedic Sarasvatī, because every mighty river need not be Sarasvatī. But if it turns out (as is likely) that the Ghaggar has been more or less in its present state for say 10,000 years or more, then the Ghaggar would automatically be ruled out as a candidate for identification with the Ṛgvedic Sarasvatī.

There is a need to carry out such a study with full rigour. It is not uncommon to see geologists taking inputs from archaeology and literature for interpreting their data. This is not in order. They should depend entirely on their own sources of information, so that their purely scientific conclusions can be used as constraints on the archaeological and literary interpretations. Humankind depends on geology; but the converse is not true.

To test the hypotheses presented here, the following two projects need to be undertaken:

i. Excavation of the region between the Helmand and the Arghandab in south Afghanistan, which has remained untouched so far.

ii. A detailed study of the geomorphology and hydrology of the Ghaggar, with a view to precisely determining the epochs of its transition from a mighty river to a mere ephemeral river to its present pitiable state. Such a study covering the entire course of the Ghaggar-Hakra can be undertaken by a joint Indo-Pakistan mission under UNESCO auspices.

SAPTA SINDHAVAḤ

Sapta Sindhavaḥ, the territory of the seven rivers, is mentioned once in Ṛv (8.24.27). However, there are repeated references to seven rivers (beginning with Ṛv 1.32.12). All attempts at identifying these seven rivers have been based on pure guesswork. Max Müller conjectured that Sapta Sindhavaḥ denotes the five Punjab rivers plus the Indus and Sarasvatī. Others have suggested that Sarasvatī should be replaced by Kubhā or even the Oxus. Sadly, these conjectures run counter to the statements in the Ṛgveda itself. Sarasvatī cannot be one of the seven rivers, because it is separately invoked (Ṛv Vālakhilya 6.4): "May Pūṣan, Viṣṇu and Sarasvatī befriend, and the Seven Streams, this call of mine". Ṛv (1.71.7) informs us that the seven mighty rivers "seek the samudra". This rules out the Punjab rivers because they fall into the Indus.

There is a striking similarity between the Ṛgvedic and the ancient Iranian description of the seven rivers. Ṛv (1.32.12): "Thou has let loose to flow seven rivers". Bundahis (20.34): "He conducted the seven navigable rivers of the source of the Vachaeni river into the same sea, and made man settle there". This suggests that a closer look at the Avestan sources may be rewarding. Since the Arghandab and Helmand are separately named as lands created by Ahura Mazda, Avestan Hapta Hindu must also be a rather small district near by. There are no explicit clues to its location. (Sir) Marc Aurel Stein has convincingly argued that various adjectives in the Avestan text Zamyad Yast (10.67) are in fact river names. Four of these could be identified through continuity in the names: Hvastra (Khash-rud), Hvaspa (Khuspas-rud), Fradatha (Farah-rud) and Hvarenanvaiti (Harut-rud); all these empty into the Seistan Hamun. The other three, Ushtavaiti, Urvadha and Erezi, have remained unidentified.[36] We suggest that these seven rivers are to be identified with the Sapta Sindhavaḥ. These rivers conform to the Ṛgvedic description of being in the neighbourhood of Sarasvatī (Helmand) and going to the sea directly.

We have argued that the river names Sarayu and Sarasvatī, that occur in both the Ṛgveda and Avesta, refer to the rivers in Afghanistan. Sarayu is the same river, Hari-rud, in both cases, whereas the name Sarasvatī applied to the Helmand in the

Ṛgveda is transferred to its tributary, the Arghandab, in the Avesta. The district of seven rivers, Sapta Sindhavaḥ, is the same in the two texts and refers to the region occupied by rivers like the Farah-rud. The term Sapta Sindhavaḥ uses sindhu in the sense of a river and therefore seems to belong to the period when the Indo-Aryans had not yet reached the river Sindhu (Indus).

The significance of the occurrence of the names Sarayu and Sarasvatī in both the texts needs to be fully appreciated. If the Ṛgvedic and the Avestan peoples used these names independently of each other, then these names must have belonged to a still earlier stage in their joint homeland. Since the central Asian region remained with the Indo-Iranians for a very long time, these names should have survived in some form or the other in their original setting. There does not seem to be any evidence that any river in central Asia ever carried the name Sarasvatī or Sarayu.

The most natural explanation for the commonality of these names is that they were given to the Afghan rivers by the Ṛgveda-composing branch of the Aryans. The Iranian branch which came to dominate the area later, decided to retain the names. When the Ṛgvedic people moved eastwards, they carried these names along and selectively reused them. The names that were not reused lost their geographical identity and became literary terms. This would explain the curious fact that inspite of the Ṛgveda's uninterrupted sanctity and the continuous Aryan presence in India, a large number of the Ṛgvedic names of rivers, lakes and mountains are unrecognizable.

8

INDO-EUROPEANS AND INDO-IRANIANS

Some put their trust in chariots, and some in horses.

—Psalm 20, v. 7

So far we have commented on the Ṛgvedic and Avestan people in the light of their own texts. We now seek to trace their "history" back to the period when the texts had not yet been composed and when they were still in the geographical vicinity of the speakers of related languages.

It has been known for more than 200 years now that a large number of languages of Asia and Europe are closely related to each other (chapter 3) and that their speakers shared a common mythology and even rituals. The relationship among the Indo-European languages is most easily seen in their vocabulary. In many languages, now geographically separated by vast distances, words for a basic concept like numbers are similar[1] (table 10). Words pertaining to an ancient and sacrosanct institution like family (mother, father, brother, sister, widow and others) are the same in many languages. Even words associated with the human body are similar. Latin anus seems to correspond to Sanskrit vaniṣṭhu, while the English gut is cognate with Sanskrit gudā. The English word fart corresponds to Sanskrit pardate, Greek perdo, Lithuanian perdzu, Russian perdet and Albanian pjerdh.[2] Such intimate vocabulary is more likely to be intrinsic than acquired.

Furthermore, it is well known that people cling to their mythology even while borrowing vocabulary and technology from others. Common mythology, as illustrated by the equivalence of Ṛgvedic Dyaus Pitṛ with Greek Zeus pater and Latin Jupiter, all meaning "sky father", underscores the basic oneness of the Indo-Europeans. Indeed, the most natural way of explaining the Indo-

TABLE 10: The number system in the Indo-European languages

No.	*Sanskrit*	*Greek*	*Latin*	*Albanian*	*Tocharian A*
1	ekas	oios	unus	nje	sas
2	dva	dau	duo	dy	wu
3	tryas	treis	tres	tre	tre
4	catvaras	tettares	quattuor	kater	stwar
5	pañca	pente	quinque	pese	pan
6	ṣaṭ	hex	sex	gjashte	sak
7	sapta	hepta	septem	shtate	spat
8	aṣṭa	okto	octo	tete	okat
9	nava	ennea	novem	nente	nu
10	daśa	deka	decem	dhjete	sak
100	śatam	hekaton	centum	qind	kant

European commonality is to assume that there existed (in the Bronze Age) a proto-Indo-European people bound together by geography, common culture and a common mother language. From their homeland, these people dispersed in stages, chalked out their individual cultural trajectories and eventually entered history.

The proto-Indo-Europeans are a postulated people. There is no direct proof of their existence. There is, for example, no text that can be assigned to them. Most of our information about them comes from oral tradition. They did not develop a writing system of their own. (They first enter historical records (of the Kassites [map 5]) in about 1900 BC in west Asia which had an old tradition of writing and where the Indo-Europeans constituted an intrusive element.[3]) Unlike the inscriptional records which are frozen in time, oral tradition represents a dynamical process which obliterates stages that have been superseded. It presents us with an end product without explicitly telling us how it was reached. If there were linguistic streams that dried up in antiquity, we would not know about them.

When we first encounter the Indo-Europeans, they are already geographically and linguistically distinct from each other. By intercomparing the extant vocabularies of various related languages, we can try to construct a hypothetical proto-Indo-European lexicon and examine it for clues to the life and times of its

speakers. Preparing such a lexicon is a non-trivial exercise. The vocabulary of a living language continuously evolves to be able to meet the needs of its speakers. On leaving their homeland, the Indo-Europeans would have encountered a number of population groups which they assimilated or displaced. Such encounters would have modified the original vocabulary.

The Indo-Europeans eventually came to occupy a huge geographical area with a natural environment vastly different from that of their homeland. Thus, while the original words representing ubiquitous items like cow or dog would have remained in vogue, words peculiar to the original environment would have become redundant. They would have been either totally discarded or given new meanings. For example, the Greek word for oak is the same as the Germanic word for the beech tree and the Russian word for the elder tree.[4] Thus, even when a proto-Indo-European word can be identified, it is not easy to ascertain its original meaning. In general, the more useful a word would have been as a diagnostic of the Indo-European homeland, the less likely it is to have survived in its original sense in sufficiently many languages to enable it to qualify for inclusion into the hypothetical original lexicon.

The Indo-European words for daughter, through their Sanskrit cognate, duhitṛ, can be given the meaning "she who milks". Presumably, in the proto-Indo-European society it was the daughter who milked the animals. There is however no common Indo-European term for milk.[5] Perhaps, in the post-dispersal era, the task of milking was transferred to non-family members, say the "natives".

Linguistic tradition is a valuable source of information on what it explicitly states. It can however be hazardous to draw firm conclusions about aspects on which the tradition is silent. If the dog barked, one can safely infer that the dog existed. But if the dog did not bark, one is left wondering whether it was the bark that was missing or the dog itself.

The inherent inadequacy of linguistic evidence is further aggravated by its inability to intersect with archaeological evidence. Archaeology cannot tell us about the languages spoken by the people who lived in the (excavated) settlements or were buried in the cemeteries. It is therefore not possible to establish a

direct correspondence between a linguistic group and an archaeological culture. Indo-Europeanism remains a hypothesis suggested by, and consistent with, the available evidence, but not proven by it.

INDO-EUROPEAN HOMELAND

While the Indo-European languages imply the existence of a proto-Indo-European community, they do not tell us anything about where it lived and when it dispersed. However, valuable clues to the homeland can be obtained by comparing the Indo-European languages with the Finno-Ugric.[6] The Finno-Ugric group includes the literary languages Finnish, Estonian and Hungarian, apart from a number of now minor languages like Lapp, Votyak and Mordvinian. There are a number of words in Finno-Ugric which are believed to have been borrowed from the Indo-European family as can be sampled from table 11.

TABLE 11: Indo-European loanwords in Finno-Ugric

	Indo-European	*Finno-Ugric*
1.	Latin sal, "salt"	Finn.[1] suola
2.	Latin porcus, "pig"	Finn. porsas
3.	Gothic wato, "water"	Finn. vete
4.	Skt.[2] madhu, "honey"	Finn. mete
5.	Skt. śatam, "100"	Finn. sata
6.	Skt. asura, "Lord"	Mordv.[3] azoro
7.	Skt. vajra, "Indra's weapon"	Finn. vasara, "hammer"
8.	Skt. varāha, "boar"	Finn. oras
9.	Skt. astra, "whip"	Hung.[4] ostor
10.	Skt. śūra, "a drink"	Hung. sor, "beer"
11.	Skt. setu, "bridge"	Mordv. sed
12.	Skt. tṛṇa, "grass"	Votyak[5] turn
13.	Skt. dāsa, "a tribe", later "slave"	Vogul[5] tas, "stranger"
14.	Skt. vasana, "garment"	Hung. vaszon

[1] Finnish.
[2] Sanskrit.
[3] Mordvinian.
[4] Hungarian.
[5] Now minor languages of the family.

The Sanskrit maks and the Avestan maksi, fly, correspond to the Finnish mehilainen, Hungarian meh and Mordvinian meks, bee. Since the Indo-Iranian term does not have an equivalent in any of the other Indo-European languages, it appears likely that in this case it was the Indo-Iranian language that borrowed a Finno-Ugric word. From the above, two conclusions can be immediately drawn. First, the Indo-Europeans and the Finno-Ugric must have lived within earshot of each other. Secondly, the Indo-Iranians must have been the last ones to disperse, so that they could borrow words from the Finno-Ugric after the European branches had already migrated.

The Finno-Ugric homeland is confidently placed in the resource-rich northern forest zone of Europe extending from the Baltic Sea to the eastern side of the Ural Mountains. These mountains extend from the Kirghiz steppes in Kazakhstan to the Arctic Ocean and form part of a natural boundary between Europe and Asia. The proto-Indo-Europeans are allotted the contiguous territory to the south of the Finno-Ugric, that is, the resource-poor steppes bordering the Caspian and Black Seas. It is noteworthy that this territory has not been associated with any other language group.[7]

From the commonality of the vocabulary it is certain that in their homeland, the proto-Indo-Europeans built villages and forts and practised agriculture (grain) and stockbreeding (cattle, sheep, goat, pig, dog).[8] They were familiar with the domesticated horse, wheeled vehicles and metal. The word for horse is the same in many of the Indo-European languages. Sanskrit aśva corresponds to Avestan aspa, Greek hippos, old Irish ech, Latin equus, old English eoh, Gothic athwa, and Tocharian B yakwe.[9] Likewise, in the case of wheeled vehicles, Sanskrit cakra is cognate with Greek keklos (cycle in English) which in plural was used to denote wheels. Sanskrit akṣa corresponds to English axle; nābhya to nave; and yuga to yoke. Sanskrit ratha (chariot) is the same as German rad and Latin rota (wheel)—as in English rotation. Similarly, the Sanskrit term ayas meaning copper (or bronze) is cognate with Latin aes and English ore.

It is surmised that the domestication of the horse transformed the proto-Indo-European society. It introduced a new food source. More importantly, horse owners could move swiftly,

cover large territories and raid pedestrian cultures without fear of retaliation. Such expeditions would require a man in charge, unlike in sedentary farming societies which are expected to have been more egalitarian. The equivalence of terms like Sanskrit rājā, Latin rex, and old Irish re, all meaning king or ruler, testifies to the presence of a hierarchical set-up in the proto-Indo-European society, which must have laid great store on war leadership. In Ṛv (1.33.5) and (6.41.3), Indra is called sthātar, one who stands firm in war. The word appears unchanged in the Latin term Jupiter Stator.[10] The associated concept of imperishable fame figures in the Vedic term akṣitaṃ śravah and the Greek kleos apthiton.[11]

The Vedic people were not merely familiar with the horse, they were obsessed with it. They had built a full-fledged cult around the horse and chariot. The names of kings and others included the words aśva and ratha: Aśvapati (lord of horses), Aśvattha (horse stand), and Daśaratha (ten chariots). Interestingly, Ṛv (5.27.4–6) mentions a prince named Aśvamedha, "offering a horse sacrifice". Distances were measured in units of āśvina, that is the distance covered by a horse in a day. Stars were named after them: Āśvayuja, the two horse harnessers (Beta and Zeta Arietia). (Aśvini is a later name for the pair.) Aryan gods like Sūrya and Agni majestically rode horse-drawn chariots. Atharvaveda (13.7.1) even calls the sun Rohita, red [horse].[12]

This horse obsession was a common feature of the Indo-Europeans, whose personal names were similarly horse based: Old Persian Visht-aspa, Greek Hipp-arkos and Phili-ppos, Gaulish Epo-pennus, and Old English Eo-maer. The Aśvins correspond to the Greek twin horsemen, Castor and Pollux, who however are associated with the the constellation Gemini rather than Aries.[13]

In absolute terms, technological advances like the advent of metallurgy and wheeled vehicles are easier to date than the domestication of the horse. It appears that copper was first extracted in the fifth millennium BC in the Kuhrud Mountains in east Iran.[14] As for wheeled vehicles, their appearance anywhere in the world is not earlier than the fourth millennium BC (see below). Thus, the Indo-European dispersal could not have taken place before the fourth millennium BC.

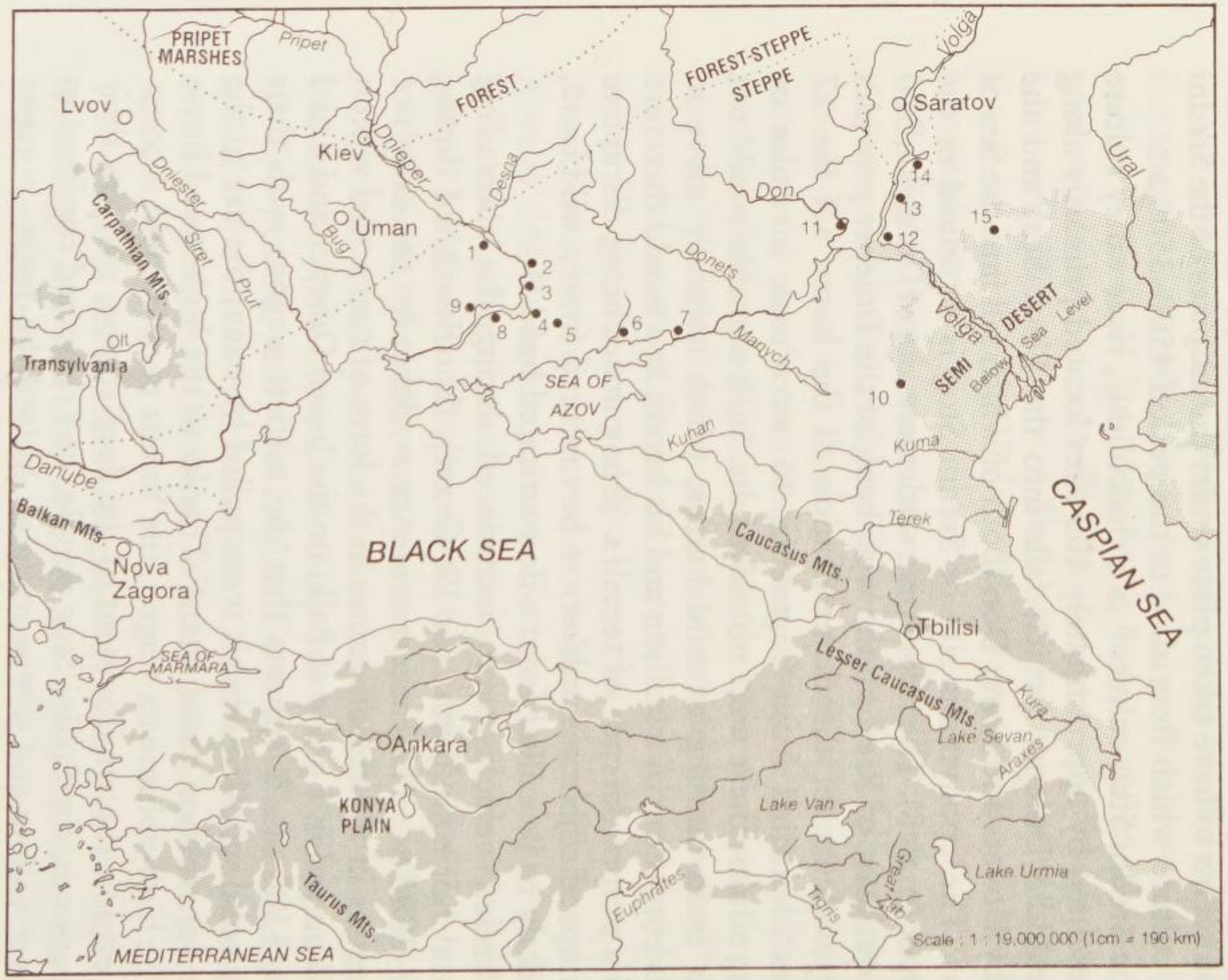
STEPPE CULTURES

Significantly, the earliest evidence for the domestication of the horse comes from the very steppe zone already suggested as the proto-Indo-European homeland on linguistic grounds. The wild horse was the most abundant animal in the steppes; its domestication seems to have taken place under the auspices of the Sredni Stog culture which flourished in the period 4500–3500 BC.

The Sredni Stog culture[15] is a chalcolithic, river-valley culture represented by approximately 100 sites located primarily along the middle Dnieper (which falls into the Black Sea) and the nearby Donets and lower Don (both of which fall into the Sea of Azov). The eponymous site of Sredni Stog is an island in the Dnieper (map 8). The impressive settlement site of Dereivka, 300 km southeast of Kiev, on the west bank of the Dnieper provides clear evidence of the domestication of the horse. Of the 17 horses identified from fragments, 15 were male juveniles or young adults; there were no old adults. Such a profile would not result from hunting of wild horses, which normally move in bands consisting of a stallion and his harem and would therefore yield a preponderence of females. Young males being disruptive and unpredictable are unlikely to be captured from a wild band, but likely to be culled from a domesticated band.[16]

Wheeled vehicles were introduced during the succeeding cultural horizon, Yamna (or Pit Grave), that flourished during 3500–2800 BC. The earliest evidence available for the existence of wagons in the region comes in the form of two actual wheels found buried in a grave at Balki on the lower Dnieper and dated about 3100 BC. It appears that the earliest wagons with their heavy solid wooden wheels were pulled by oxen; the use of the horse for traction came later.[17] Thanks to the high-speed horse and the high-volume ox wagon, the Yamna people could successfully exploit the environment of the deep steppe, whereas their predecessors, the Sredni Stog people, had remained confined to the river valleys and steppe margins. Indeed the Yamna horizon stretched across a distance of 3,000 km, from the rivers Bug and Dnieper in the west to the Ural and Embra in the east.

Unlike the Sredni Stog culture where most of the information comes from the settlement sites, our main source of information on the Yamna culture are the burial sites. To bury the dead, a pit



MAP 8. Archaeological cultures believed to be associated with the proto-Indo-European speakers. Sites 1–7 define Sredni Stog culture and sites 8–15 the Yamna horizon. Sites 1 (Dereivka), 4 (Sredni Stog), and 8 (Balki) are named in the text (after Anthony 1986, fig. 1).

was dug and the body placed on the back, with legs flexed, that is, with the knees raised over the stomach. The head was turned either north or northeast. The body was either placed directly on the bottom of the pit or on a floor made of wooden planks or weeds and rushes. Very often ochre was added. It was a common practice to furnish the graves with goods ranging from knives and wheels to bird and animal bones. The grave was covered with stones, or timber planks were used to form a roof. The burial was surrounded by a circular ring of stones, known as cromlech. A hearth was often placed next to the burial. The most notable feature was the erection of a mound or a kurgan over the grave.

The Yamna culture is the last culture associated with the proto-Indo-Europeans as a whole.[18] Thanks to the horse and wagon, the Indo-Europeans spread into Europe and Asia, so that the post-Yamna cultures are credited to the differentiated Indo-European speakers. In the Volga steppes, the Yamna was succeeded by the Hut and the Catacomb Grave culture (c. 2800–2000 BC) and the Srubnaya or the Timber Grave culture (c. 2000–1500 BC). East of the Urals, the major, more-or-less corresponding cultures were the Afanasievo (c. 3000–2500 BC) and the Andronovo cultures (c. 1900–1500 BC)[19] (table 12).

The Afanasievo culture of south Siberia is known from about 10 settlement sites and about 50 cemeteries, containing over 400 graves. The settlements, at least those on the Yenisey River, are rather insubstantial and are interpreted as the seasonal camps of pastoralists who raised cattle, sheep, goats and, significantly, horses. Although wheeled vehicles have not been directly attested, it is suspected that the Afanasievans possessed them. The succeeding Okunevo culture[20] does provide evidence for wheeled vehicles.

The Afanasievan funerary practices as well as pottery and other artefacts correspond to the Yamna culture. There is however one problem. The Yenisey River in the Afanasievan cultural territory lies at an enormous distance of about 2,000 km from the Ural, the generally accepted eastern limit of the Yamna culture (map 9). It is expected that future excavations will uncover intermediate sites.[21]

The later Bronze Age in the region from the Ural to the Yanisey is represented by the Andronovo culture. Spread over a large

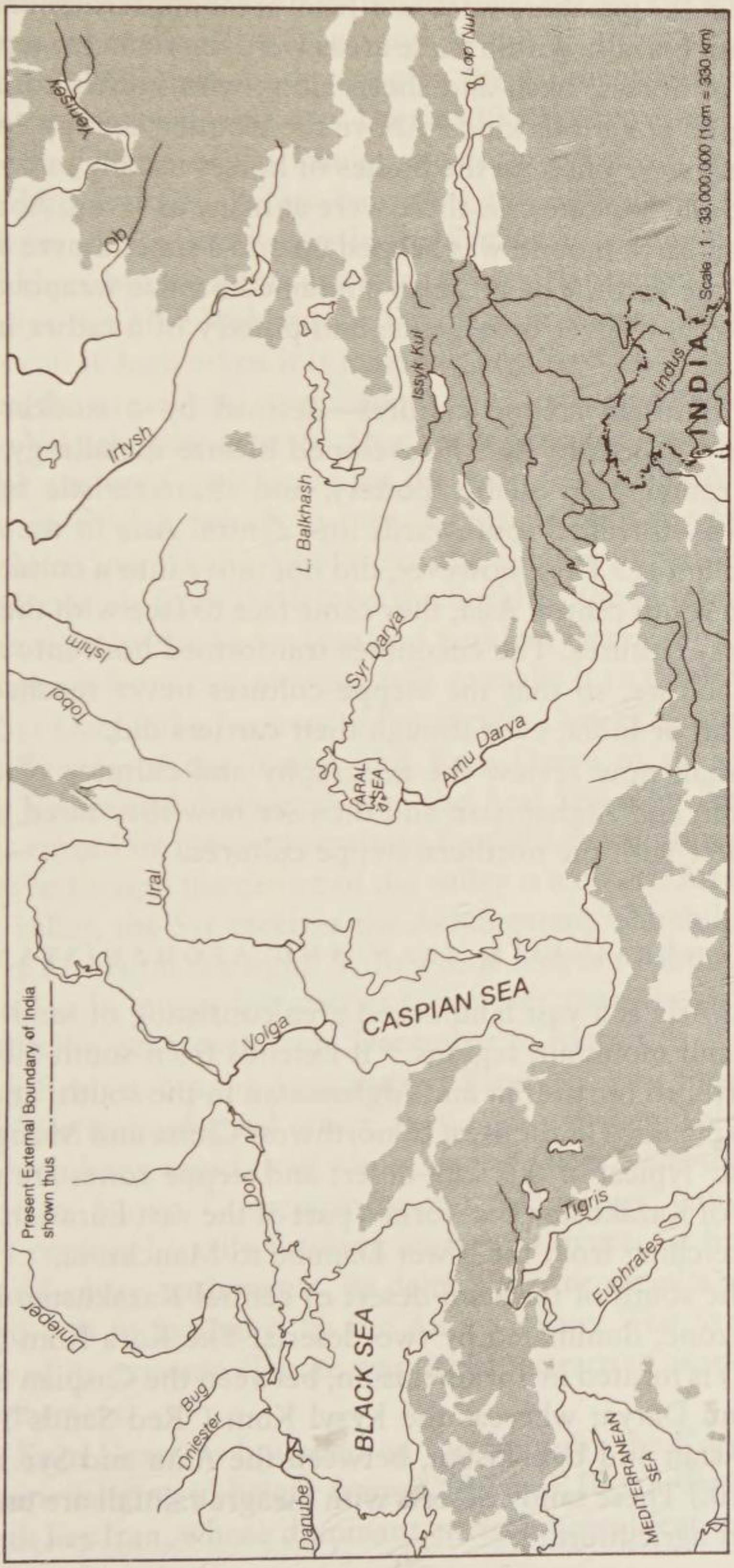
TABLE 12: Archaeological cultures of Eurasian steppes, associated with the Indo-European speakers

West of the Urals	*East of the Urals*
Sredni Stog (c. 4500–3500 BC)	
Pit Grave or Yamna (c. 3500–2800 BC)	
Hut and Catacomb Grave (c. 2800–2000 BC)	Afanasievo (third millenium BC)
Timber Grave or Srubnaya (c. 2000–1500 BC)	Andronovo (Petrovka) (c. 1900–1700 BC)
	Andronovo (Alakul[1]-Fedorovo[2]) (c. 1700–1500 BC)

[1] In west Kazakhstan.
[2] In central and east Kazakhstan.

area, it was not a homogenous culture, but a federation of related, broadly similar cultural groups which displayed noticeable local variations. One can define an earlier, Petrovka Andronovo, culture (c. 1900–1700 BC). It was followed by the Alakul variant in west Kazakhstan and the Fedorovo variant in central and east Kazakhstan (c. 1700–1500 BC).[22]

The Andronovan economy was predominantly based on stock-breeding of cattle, goats, sheep and horses but not pigs. The horse was ridden as well as used in drawing vehicles. What the horse and chariot meant to the Andronovans can be seen from the Petrovka cemetery site of Sintashta I. Here in five of the burial pits, light horse-drawn war chariots have been found, buried along with the rider.[23] The chariots have a rectangular body, 120 cm × 60–70 cm in area, an axle 140 cm wide, and wheels 90–120 cm in diameter probably with 10–12 spokes.[24] The chariot was not a cumbersome cart with four wheels cut out of wood but a two-wheeled carriage, mobile and light. The horse team drawing the chariot was interred as well.



MAP 9. Geographical extent of the archaeological cultures believed to be associated with the Indo-European and Indo-Iranian speakers

Within the pits there were sacrificial areas apparently unassociated with burials. Within these areas were the remains, especially skulls, of horses, oxen and sheep along with vessels containing grave gifts of various kinds. Above the wooden canopy covering the tomb were piled up the bodies of horses usually in twos and fours, though in one case there were as many as seven. Above the tomb, an earth mound was heaped up and a funeral pyre lit, reddening the earth. The pits also contained bronze weapons; copper, gold and silver ornaments; and pottery of a rather inferior type.[25]

The Eurasian steppe cultures—defined by a stockbreeding economy, generally highly developed bronze metallurgy, handmade, rather poor-quality pottery, and characteristic funerary practices—travelled southwards into central Asia in the second millennium BC. They, however, did not move into a cultural vacuum. In south central Asia, they came face to face with the native sedentary cultures. The encounter tranformed both into a composite culture, so that the steppe cultures never reached west Asia, Iran or India, even though their carriers did.

We shall now review the geography and cultures of central Asia, Iran and Afghanistan and then see how they fared in their encounter with the northern steppe cultures.

CENTRAL ASIA, IRAN AND AFGHANISTAN

Central Asia is a vast landlocked area consisting of semi-desert, desert and mountain regions.[26] It extends from south Siberia in the north, to north Iran and Afghanistan in the south; and from the Caspian Sea in the west to northwest China and Mongolia in the east. Typical of the semi-desert and steppe zones are the expanses of Kazakhstan that form a part of the vast Eurasian steppe belt stretching from the lower Danube to Manchuria.

To the south of the semi-desert of central Kazakhstan lies the desert zone, dominated by two deserts. The Kara Kum ("Black Sands") is located in Turkmenistan, between the Caspian Sea and the Amu Darya; whereas the Kyzyl Kum ("Red Sands") lies in Kazakhstan and Uzbekistan, between the Amu and Syr Darya[27] (map 10.) These sandy deserts with meagre rainfall are unable to support agriculture.

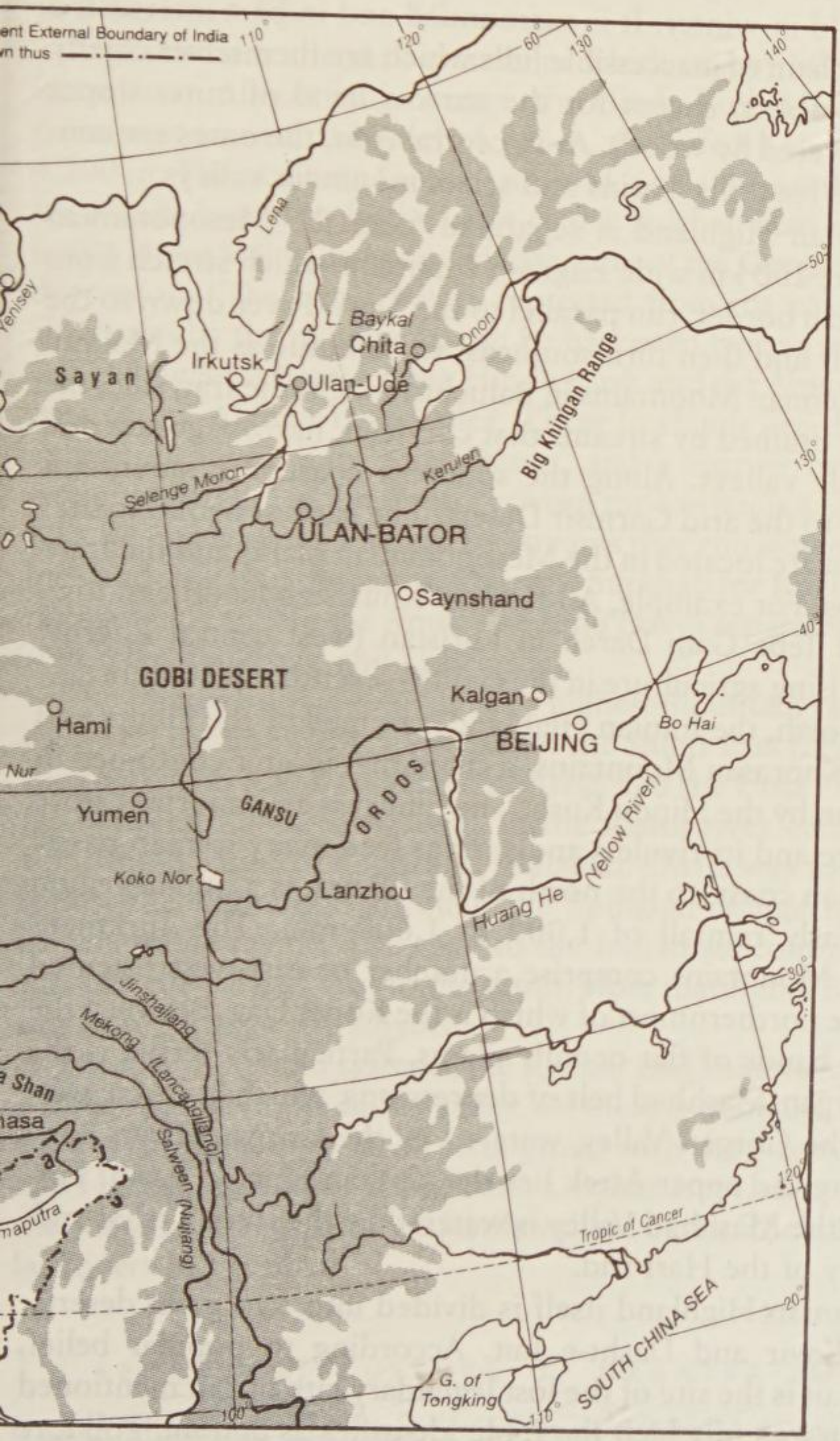
The major waterways in central Asia are fed by glaciers and melting snows of the Hindu Kush and Pamirs. The Tedzhen/Hari-rud and the Murghab, both rising in the Hindu Kush, end in blind deltas in the Kara Kum. The 2,500 km long Amu Darya rises in the glaciers of the Pamirs and empties on the southern shore of the Aral Sea. Before becoming the Amu, it has several local names. At its headwaters in the Pamirs, it is known as the Ab-e Wakhan, but the name changes to Ab-e Panja when the Ab-e Pamir joins the Ab-e Wakhan. In Tajikistan its name is Panj. The Afghans call it Amu when it is joined by the Kokcha. Very often, however, the name Amu is applied when a more important tributary, the Vakhsh, runs into the Ab-e Panja from the central Asian side. The ancient Greek name for the Amu Darya, Oxus, is derived from Vakhsh, which in turn is cognate with the Sanskrit Vakṣu. After leaving the hilly areas, the Amu is joined by only three tributaries: from the left by the Surkhab (or Kunduz), and from the right by the Kafirnigan and Surkhan Darya. The Zeraf-shan, flowing from east to west, fails to make it to the Amu.

The Syr Darya (the Jaxartes of the ancient Greek) is formed by the confluence of the Naryn and Kara Darya in the eastern Fargana valley and discharges into the Aral Sea. The Ferghana Valley is ringed by mountains whose foothills sustain flourishing oases, even though the centre of the valley is a desert. After leaving the valley, the Syr receives the Akhangaran, Chirchik, Keles and Arys Rivers on the right. With a total length of about 3,000 km, the Syr is longer but carries less water than the Amu. Its lower reaches get frozen from December to March.

It is difficult to tap the Amu and Syr Rivers for irrigation without a major technological effort. Particularly indomitable is the Amu which has a rapid flow whose power far exceeds the resistance of its banks. Consequently, the "mad river" constantly changes course, literally washing away in a matter of hours its banks and entire settlements. Its delta however permits agriculture and was in fact used by the Andronovans. The Syr Delta because of its extreme climate was not an attractive proposition for the farmers.

Kara Kum Desert is bounded on the south by the Kopet Dag Mountains ranging in height from 2,500 to 3,100 m. Further to the south lies Iran, whose dominant environmental feature is the

MAP 10. Central Asia (after Dani and Masson 1992, inside cover)


ent External Boundary of India
vn thus
110°
120°
60°
130°
140°
Lena
Yenisey
L. Baykal
Chita
Onon
Irkutsk
Sayan
Ulan-Ude
Big Khingan Range
50°
130°
Selenge Moron
Kerulen
ULAN-BATOR
Saynshand
GOBI DESERT
Kalgan
Hami
BEIJING
Bo Hai
Nur
Yumen
GANSU
ORDOS
Koko Nor
Lanzhou
Huang He (Yellow River)
90°
Jinshajiang
Mekong (Lancangjiang)
a Shan
hasa
Salween (Nujiang)
naputra
Tropic of Cancer
120°
SOUTH CHINA SEA
20°
G. of Tongking
100°
110°

Iranian Highland, the eastern part of which extends into Afghanistan and Baluchistan. The highland is a vast and frequently waterless tract of high deserts and steppes which are hot in summer and cold in winter. It is surrounded and in part intersected by a broad chain of inaccessible hills which are themselves chiefly steppe and desert, except for the narrow band of outer slopes which is covered by woods. As in central Asia, the oases are confined to the foothills, basins and select mountain valleys.

The Iranian Highland is separated from the Mesopotamian plains by the 200 km wide Zagros Mountains which stretch from the Armenian border, run parallel to the Tigris River down to the Persian Gulf and then turn southeast to continue as the Makran and the Suleiman Mountains in Baluchistan. On the Iraq side, the Zagros are drained by streams that cut deep, narrow gorges and water fertile valleys. Along the southern coast, the mountains drop away to the arid Garmsir Desert. The earliest neolithic sites in west Asia are located in the Mesopotamian plains and the Iran-Iraq Zagros. For example, Ali Kosh in Khuzistan (southeast lowlands) and Tepe Ganj Dareh in Luristan (west central Zagros) were practising agriculture in the eighth–seventh millennium BC.

To the north, the Iranian Highland is framed by the Elburz and Turkmen-Khorasan Mountains, a chain that is later continued in Afghanistan by the Hindu Kush. The Elburz is an important store of moisture and its rivulets and springs feed many Iranian oases. The Caspian coast, to the north of the Elburz, is a humid region with a yearly rainfall of 1,000 to 1,600 mm. The Turkmen-Khorasan Mountains comprise a number of east-west oriented ranges, the northernmost of which is the Kopet Dag. Between the ranges lie bands of flat or hilly plains. Particularly fertile is the moist Gorgan-Mashhad belt of depressions, which at its far west includes the Gorgan Valley, watered by the Gorgan River. Eastward along the upper Atrek lies the Kushan-Shirvan basin. Further east, the Mashhad Valley is watered by the river Kashaf-rud, a tributary of the Hari-rud.

The Iranian Highland itself is divided into two great deserts: Dasht-e Kavir and Dasht-e Lut. According to popular belief, Dasht-e Lut is the site of the lost legendary city of Lut mentioned in the Quran and which the Bible identifies as Sodom. Folklore holds that by God's hand the entire area was turned into salt. It is

impossible to cut across these hostile deserts. The east-west caravan routes run along the peripheral hills following the chain of oases, while the north-south movements use passes in the Elburz and Turkmen-Khorasan Mountains.

Afghanistan is a land of mountains which occupy 80 per cent of its territory. Almost in the centre, the Hindu Kush Mountains run from west to east, the chief of which, the Safed Koh, rises up to 4,200 m. The northern foothills are arid, while the southern slopes have some humidity. In the basin of the Tedzhen/Hari-rud lies the fertile Herat Valley, an eastward extension of the Gorgan-Mashhad depressions. The Herat Valley, protected from the cold northern airstreams by the mountains, can be harvested twice a year.

The lowlands between the Hindu Kush and the Amu Darya are part of the Afghan-Tajik Valley. These lowlands are the natural extension of the Kara Kum Desert, and a narrow belt of sand stretches parallel to the Amu. Between the lowlands and the foothills lie fertile oases watered by streams that run down from the hills and sink into the sands. Only the Surkhab (or Kunduz) flows permanently to join the Amu. The Amu Darya separates Afghanistan from Tajikistan and Uzbekistan.

The Hindu Kush is among Asia's highest mountain ranges. The east-west routes use the high passes: the Shibir Pass (2,987 m) on the road from Kabul to Mazar-e Sharif, and the Unai Pass (3,444 m) between Kabul and Herat. In the Kabul river valley lie the flourishing basins of Kabul and Jalalabad. On its way towards the Indus, the Kabul cuts through the Spinghar Range in a deep, impenetrable ravine. The road to the Indian subcontinent leads through the Khyber Pass to the south. Note that Kabul River does not flow through the Khyber.

The low mountain systems, the Kirthar and Sulaiman, separate Baluchistan from the Indus Valley. Of these mountains, the highest (up to 3,300 m) is the Quetta group with the passes of Bolan and Harnai, used since ancient times. Baluchistan has at its centre the Kalat Highland, and the fertile valleys of the Zhob and Loralai Rivers in the north.

SEDENTARY CULTURE OF GREATER IRAN

Iran, Afghanistan and southern parts of central Asia may be collectively referred to as Greater Iran[28] for want of a better term.

Greater Iran, elevated between the valleys of the Euphrates and Indus, took to agriculture in the wake of pioneering developments in the western Zagros and the Mesopotamian plains, which in turn were contemporaneous with those in Baluchistan.

Because of a general paucity of soil and water, agriculture in Greater Iran was confined to selected pockets. The economy was less productive than in the river valleys, and the public architecture (compared to the Mesopotamian ziggurat and the Harappan granary) was markedly unspectacular. The various cultural centres, separated from each other by long stretches of desert wasteland, did not achieve the integration of the Harappan urban phase, even though they interacted with each other thanks to the use of camel carts. Iran is richly endowed with mineral deposits. Copper implements were therefore widely used and exported. The ore was processed by the native population, not only for its own use but also for export to Mesopotamia and south Turkmenistan.

It will be convenient to first examine the archaeological history of south Turkmenistan and then use it as a benchmark for a general discussion. South Turkmenistan, it may be noted, is geographically and culturally linked with northeast Iran. The oldest farming village site in south Turkmenistan is Jeitun, 30 km north of Ashkhabad, the republic's capital. Jeitun lies at the southern edge of the Kara Kum Desert on the northern foothills of the Kopet Dag. It sits atop a sand dune in the delta of a mountain stream. Spread over half a hectare, the Jeitun site has been fully excavated.

The basic dwelling unit in Jeitun was a single-room house with a hearth. Each house had a courtyard with an outhouse probably used as a farmstead. All structures were made of cylindrical clay bricks. Expectedly, the quality of construction of the houses was superior to that of the farmsteads. In Jeitun there were in all 30 houses whose area varied from 13 m^2 to 39 m^2, with an average area of 20–30 m^2. Each house, it is believed, was meant for a nuclear family. If each family had five to six members, the total population of the village would have been about 150–180.[29]

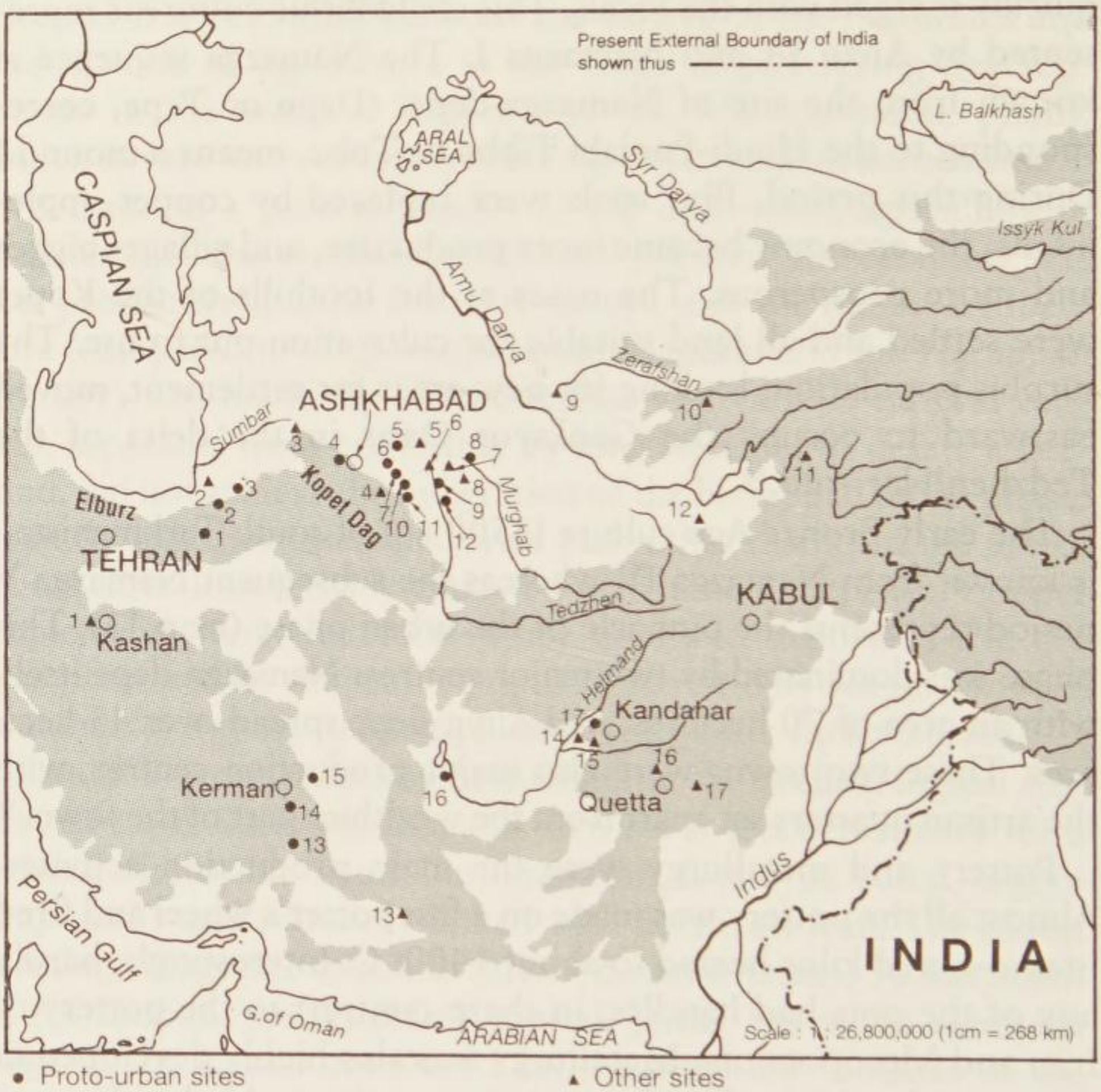
Jeitun and other similar villages stretching along the Kopet Dag foothills constituted the modest neolithic Jeitun culture. Its transformation into a metal-using culture is believed to have been ushered in by the arrival of tribes from northeast Iran who

quickly merged with the locals. This chalcolithic culture is represented by Anau IA and Namazga I. The Namazga sequence is known from the site of Namazga-depe. (Depe or Tepe, corresponding to the Hindi-Punjabi Tibba or Toba, means a mound.) During this period, flint tools were replaced by copper implements, the economy became more productive, and villages bigger and more prosperous. The oases at the foothills of the Kopet were settled and all land suitable for cultivation put to use. The surplus population, looking for new areas for settlement, moved eastward to occupy the Geoksyur Oasis in the delta of the Tedzhen/Hari-rud.[30]

The early Bronze Age culture (2500 BC) of south Turkmenistan is known from Namazga IV, whereas the subsequent Namazga V period represents the pinnacle of the urban phase (map 11). This phase was dominated by two major centres: Namazga-depe itself, with an area of 70 hectares, and Altyn-depe spread over 45 hectares. These two towns were also major production centres, with the artisan quarters set apart from the wealthier part of the town.[31]

Pottery and metallurgy were the main production activites. Almost all the pottery was made on a fast potter's wheel and fired in two-tiered kilns heated to about 1400° C. Interestingly, hardly any of the pots had handles, in sharp contrast to the pottery of Iran and Mesopotamia. Metallurgy was also highly developed in this period, with lead and arsenic being often added to bronze. An artefact even made of brass (an alloy of copper and zinc) was found. Progress in metallurgy is attested to by the appearance of bronze vessels, small pots and flat-handled pans.[32]

A large number of seals were also produced in this period. They were made of nearly every available material: stone, clay and even turtle shells. The most common were bronze and silver seals with a lug on the reverse side for suspension. They were probably worn as belts because they have been found in ancient burials, always located near the pelvic bones. Of special interest are the zoomorphic seals, most of which bear representation of horned domestic animals. Eagles in "heraldic poses" also occur. Significantly, this metal art shows continuity with the earlier, less advanced, Namazga IV phase when zoomorphic designs were painted on pottery.[33] The wealthier part of Altyn-depe contained a notable monument: a 12 m high pyramidal tower or a ziggurat



• Proto-urban sites

1 Tepe Hissar
2 Turang-tepe
3 Yarim-tepe
4 Ak-depe
5 Anau
6 Kara-depe
7 Namazga
8 Kelleli
9 Geoksiur
10 Ulug-depe
11 Altyn-depe
12 Hapuz-depe
13 Tepe Yahya
14 Tal-e Iblis
15 Shahdad
16 Shahr-e Sokhta
17 Mundigak

▲ Other sites

1 Sialk
2 Shah-tepe
3 Parhai
4 Toichnak-depe
5 Kosha-depe
6 Shor-depe
7 Yassy-depe
8 Dashlyji
9 Zaman-baba
10 Sarazm
11 Shortugai
12 Dashli
13 Shah Huseini
14 Deh Morasi Ghundai
15 Said Qala
16 Kili Gul Muhammad
17 Mehrgarh

MAP 11. Settled Bronze Age sites of central Asia
(after Tosi, Shahmirzadi and Joyenda 1992, map 7)

built in obvious but poor imitation of Mesopotamian ziggurats. Its construction would have required about half a million sun-baked bricks and a large labour force.[34]

In the adjoining northeast Iran, the Neolithic Age is known from the twin mounds of Sang-e Chakmak ("flint stone") that lie just to the east of the Damghan Plain south of the Elburz Mountains. The Bronze Age sites include Tepe Hissar, Turang-tepe and

Yarim-tepe (map 11). The close relationship between south Turkmenistan and northeast Iran is well attested. In particular, the mature urban Namazga V period corresponds to Hissar III.

A grey ware vessel found at Altyn-depe is identical to the vessels found at Hissar. Since grey ware was not at all produced in south Turkmenistan at that time, there can be no doubt that it was imported from the Hissar cultural area.[35] Northeast Iran on its part has revealed a number of artefacts that are analogous to the ones found in the Namazga V culture: compartmented bronze seals; beads in the form of a stepped square; and large alabaster discs with handles. A number of sites in the region have revealed alabaster mini-columns. Since there is no evidence of alabaster working in Hissar, and since these items appear abruptly in sequence, it is believed that they were imported from south Turkmenistan. The influence of this joint culture extended up to north central Iran as evidenced at Tepe Sialk in the Kashan Oasis at the edge of Dasht-e Kavir.[36]

Two hoards, discovered at Altyn-depe, draw pointed attention to the trade contacts of Namazga V with India. These hoards contain objects of Indian ivory: square and oval-shaped gaming counters; and small sticks of rectangular cross-section with circles on three sides and inscriptions on the fourth. Numerous such objects have been found in Mohenjodaro also. The three-headed monster on a silver seal at Altyn-depe appears to have been inspired by the Indus seals.[37] The presence of the Harappan trading post at Shortugai in north Afghanistan, on the Amu Darya, underlines the trade links between India and central Asia.

The trade route from the Indus Valley to central Asia and northeast Iran passed through Mundigak in the Helmand basin. The developments in Mundigak were triggered off by those in Baluchistan. Unlike Baluchistan, however, Mundigak went on to enter the urban phase. From a small agricultural centre (Periods I–III), Mundigak emerged as a major urban centre (Periods IV–V), to be abandoned during the Iron Age. Mundigak owed its prosperity not to agriculture but to its location on a trade route. Another major centre in the region was Shahr-e Sokhta in the Seistan.[38]

Prehistoric southeast Iran is represented by a number of sites: Tal-e Iblis located in the Bard Syr Valley, south of Kerman;

Shahdad, east of Kerman on the edge of Dasht-e Lut; Tepe Yahya, less than 150 km south of Kerman; and the Bampur Valley, 350 km to the east in Persian Baluchistan. Tepe Yahya owed its importance, at least in part, to its location on the overland route connecting the Indus Valley with Mesopotamia.[39]

It was inevitable that the peripatetic steppe culture people would meet the southern farmers and townsmen on the latter's home turf. The earliest example of the synthesis between the steppe and the southern cultures comes from Zaman-Baba situated amidst small channels and lakes in the delta of the Zerafshan, close to the Amu Darya. The site, consisting of a settlement and a burial ground, has been placed in the time bracket c. 2500–2000 BC. The houses here were subterranean, that is the floors were sunk slightly below the ground level. Burials were in singles and pairs, in pits and stone chambers. The pottery was crude and handmade. All these features carry the signature of the steppe cultures. At the same time, features borrowed from south Turkmenistan were apparent: the forms of the beads, bronze pins, presence of pottery kilns, and a flat baked-clay figurine. In addition, sherds of pottery have been found that are identical to the Namazga IV type.[40]

Broadly speaking, Jeitun corresponds to Mehrgarh, Namazga I to the early Harappan sites like Amri, whereas Namazga V and Altyn-depe correspond to cities like Harappa and Mohenjodaro. With the Namazga V phase ended the autonomy of the sedentary cultures of Greater Iran. The post-urban cultures were dominated by elements that arrived from the northern steppes.

MURGHAMU (MURGHAB-AMU) CULTURE (c.2100–1700 BC)

The urban culture of Greater Iran collapsed in about 2100 BC. In south Turkmenistan, from where the most detailed information is available, Altyn-depe became totally derelict and the flourishing city of Namazga-depe was ruined. Atop its ruins came up a small impoverished village, no more than 2.5 hectares in size. It was less than half the size of erstwhile Altyn-depe's artisan quarters alone.[41] No data are yet available on the fate of the northeast Iranian cities of Tepe Hissar and Turang-tepe. But in the Seistan,

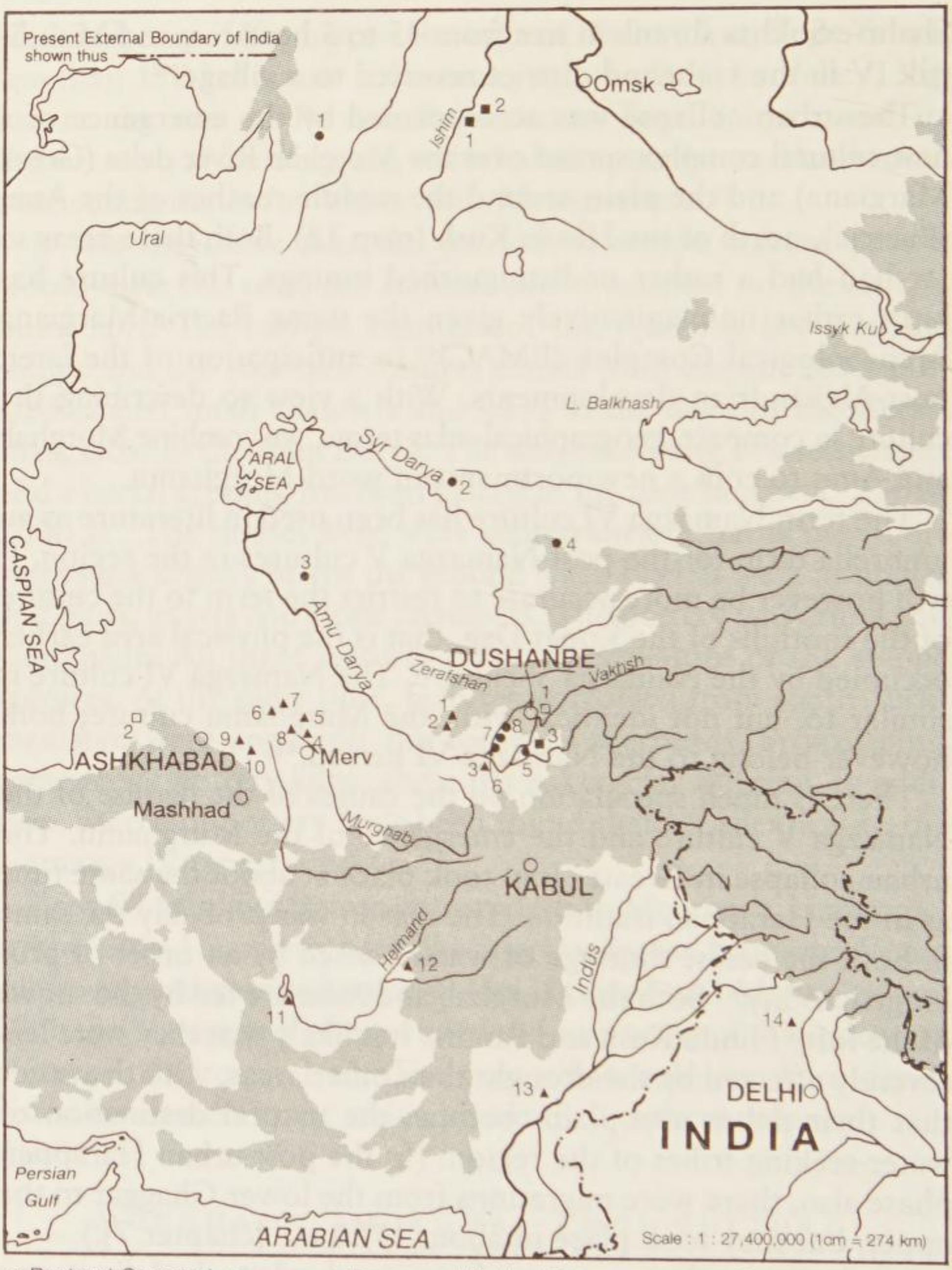
Shahr-e Sokhta shrank in size from 45 to 5 hectares, and Mundigak IV in the Helmand district reverted to a village.[42]

The urban collapse was accompanied by the emergence of a new cultural complex spread over the Murghab River delta (Greek Margiana) and the plain around the middle reaches of the Amu (Bactria), north of the Hindu Kush (map 12). Both these areas so far had had a rather undistinguished innings. This culture has been rather unimaginatively given the name Bactria-Margiana Archaeological Complex (BMAC)[43] in anticipation of the later, post-Alexandrian developments. With a view to describing the culture in compact, geographical-atlas terms, we combine Murghab and Amu to coin a new portmanteau word Murghamu.

The term Namazga VI culture has been used in literature as an umbrella term for the post-Namazga V cultures in the region. It will however be more accurate to restrict the term to the culture of the foothills of the Kopet Dag, that is the physical area earlier occupied by the Namazga V culture. The Namazga VI culture is similar to, but not identical with, the Murghamu culture; both however belong to the Namazga VI period.[44]

There is much speculation on the causes of the demise of the Namazga V culture and the emergence of the Murghamu. The urban collapse in Greater Iran took place at about the same time as in the Harappan tradition. The reason was probably the same in both the cases: shortage of water caused by an onset of prolonged aridity.[45] Both the Murghab and Amu are fed by the snows of the lofty Hindu Kush and Pamirs. It is likely that they were less severely affected by the drought than other areas, with the result that their deltas and plains became the natural destination of water-seeking tribes of the region. (In the post-urban Harappan phase also, there were migrations from the lower Ghaggar to the upper, but they took place in about 1700 BC, [chapter 7].)

Maybe, it was the same quest for water that launched the steppe people on their southward march. The new arrivals had no difficulty in filling the economic and political vacuum they encountered. The steppe elements are clearly present in the Murghamu culture. Also, the region was occupied by Iranian-speaking people during historical times. Therefore, it is reasonably certain that the Murghamu people were Indo-Iranian speakers. They are however not the Ṛgvedic people, because the geographical setting and the cultural details do not match. (The Ṛgvedic people



• Pastoral Cemeteries

1 Sintashta
2 Tautara
3 Kokcha
4 Tash-tepe
5 Tigrovaya Balka
6 Aruktau
7 Bishkent
8 Tulkhar

▲ Towns and Settled Sites

1 Jarkutan
2 Sapalli
3 Dashli
4 Tahirbai 3
5 Auchin
6 Kelleli
7 Taip
8 Gonur
9 Namazga
10 Elkeri-depe
11 Shahr-e Sokhta
12 Mundigak
13 Jhukar
14 Bhagwanpura

■ Pastoral Sites

1 Novonikolskoye
2 Petrovka
3 Makan - e Mar

□ Other Sites

1 Tandyriul
2 Sumbar

MAP 12. Late Bronze Age sites of central Asia
(after Masson 1992c, map 11)

probably came down from the steppes in c. 1700 BC during the closing years of the Murghamu culture.)

The richness of the Murghamu culture may well have been due to its being a genuine melting pot for the various cultures of the time. It is however remarkable that the transition was smooth. There are no signs of bloodshed, warfare or arson. It seems that the old urbanites quickly and quietly accepted the new ground realities. The same pattern was repeated in India (see chapter 9).

In the Murghamu area, the archaeological sites are named after the mounds or the oases. Different sites on an oasis are distinguished from each other by suffixing numerals to the name of the oasis (Togolok 21, Dashli 3, and so on). In the Murghab Delta, the oldest settlements are associated with the Kelleli Oasis. The other old sites are Auchin, Taip, Gonur, Togolok, and others. The Gonur Oasis housed the largest settlement, measuring 28 hectares, which was probably the local capital. The Tahirbai group of sites represents later settlements in the delta. See table 13.

TABLE 13: Calibrated radiocarbon dates from the Murghamu culture

Site name	*Date*	*Remarks*
	A. Murghab Delta (Margiana)	
1. Gonur 1	1887 BC	–
2. Gonur Kremel	1887 BC	–
3. Gonur Kremel	1973 BC	Namazga V
4. Gonur North	2921, 1936, 1740, 1568 BC	Namazga V
5. Gonur South	2071 BC	Namazga VI
6. Togolok 21	1745 BC	Namazga VI
	B. Amu Plain (Bactria)	
7. Sapalli-depe	2009 BC	Namazga V/VI
8. Sapalli-depe	1742 BC	Namazga VI
9. Jarkutan	1884 BC	Namazga VI
10. Mollali-depe	2140 BC	Namazga II (?)
11. Dashli 1	1818, 1443 BC	–
12. Dashli 3	2879, 2577, 1919, 1516 BC	Square building
13. Dashli 3	1350 BC	After abandonment of circular building.
14. Dashli 3	1740 BC	Outside circular building.

The Amu Darya cuts the Bactrian territory into two, so that the north Bactrian sites fall in south Uzbekistan and south Tajikstan, while the south Bactrian ones belong to north Afghanistan. The oldest sites in north Bactria are represented by Sapalli (map 12). The later cultural phases are known from Jarkutan followed by Mollali.[46] In south Bactria, the key area is the Dashli Oasis, 30 km south of the Amu, watered in antiquity by the delta channels of the Balkhab River.

The Murghab Delta settlements greatly varied in size, ranging from half a hectare to 28 hectares. A typical town consisted of a squarish fortification with round or oval towers at the corners, and separate artisan quarters near by. It is estimated that the population of the bigger settlements was about 250.[47]

Murghamu and Namazga VI show unmistakable signs of a break with the past and the arrival of new people. Earlier, human settlements and burials were located at the same place; but now the cemeteries were separated from the habitation areas.[48] The Yangi Kala cemetery in the Murghab Delta contains pit graves in which the bodies were laid on the left side with the knees drawn up, but variously oriented. There are traces of open fire within the pits. These burial customs are familiar from a number of northern steppe cultures.

Although the potter's wheel and the two-tier kiln continued to be in use as before, the shapes of vessels became cruder and less varied, and the manufacturing techniques less refined. Domestic pots and disc-shaped shallow plates were made by hand.[49] In the manufacture of metal articles there was continuity as well as change. The basic tool types were retained from the urban phase, but new types were also introduced. For example, a sickle-shaped, single-edged knife had its analogies in the settlements of the Andronovo culture. In jewellery, the old traditions continued unchanged.

The break with the past was more conspicuous in the minor arts. The marvellous clay figurines of the earlier period made way for figures of a disappointingly low standard. Indeed, the whole tradition of making clay figurines, which undoubtedly had a neolithic origin, was gradually allowed to lapse so that by the beginning of the Iron Age their manufacture had ceased totally. (This is true in the case of the Harappan tradition as well.)

Decorations as seen on the clay figurines of the Namazga V period disappeared. Significantly, one pedestal from Namazga-depe itself (during the Namazga VI period) was decorated by a svastika, an absolutely new motif in local symbolism. It was never found again in the entire rich collection of south Turkmenistan painted pottery.[50]

The most fascinating aspect of the Murghamu culture is the presence of a large number of flat and cylindrical copper-bronze seals and flat stone amulets. In the Murghab Delta these objects were unearthed in proper archaeological excavations. But in north Afghanistan they were plundered from graves, to promptly end up in antiquarian shops and foreign museums.

The Murghamu seals and amulets depict scenes and motifs involving deities, heroes, and real and mythical animals. The most conspicuous deity is an eagle-man, with the head and wings of an eagle attached to a male torso. He is often shown seated on, or holding, a snake. The inspiration for the eagle-man deity was probably the short-toed eagle *(Circoetus gallicus)* which feeds almost exclusively on snakes, lizards and frogs. It is a migratory bird which spends the winter at southern latitudes and flies over the Hindu Kush to arrive in central Asia in spring.

The male deities are distinguished from human beings by their having wings and horns and animal symbols. There is, in addition, a female deity which has wings and is also associated with animals. Intriguingly, while male deities appear everywhere, the female deity is confined to the Amu Plain; she is not known to the Murghab Delta. The heroes and deities are shown at peace with birds and plants and as masters of animals which seem to represent the brute force of nature. This is in contrast to the situation in Mesopotamia where the hero is shown at war with animals. The negative forces and evil are invariably represented by snakes and dragons which generally look like either snakes or lions.[51]

The Murghamu scenes and motifs show an unmistakable correspondence with Mesopotamian and Syro-Hittite objects. There are clear-cut parallels with the Indus objects also. For example, a male hero fighting two tigers reminds one of the Mesopotamian Gilgamesh, on the one hand, and a Harappan seal, on the other. Similarly, a buffalo-horned squatting deity on a seal from Mohen-

jodaro would have felt at home in Murghamu. This suggests that all these areas formed a close-knit interaction system characterized by trade, transfer of ideas, and even of people.

TOGOLOK 21 AND SOMA

A noteworthy feature of the Murghamu culture are the public buildings which obviously had a cultic significance. At Togolok 21 in the Murghab Delta (with a calibrated radiocarbon date of 1745 BC),[52] a huge rectangular complex, 130 m × 100 m in size, with circular turrets at the corners and semicircular ones at midwalls, was unearthed (figure 3). Inside this was another rectangle, much smaller but also with circular and semicircular turrets. All along the inner side of its western wall, there were 30-odd narrow rooms.

Inside this rectangle was the "fortress", measuring 50 m × 60 m, with 4.5 m thick walls, and turrets. In the middle of the

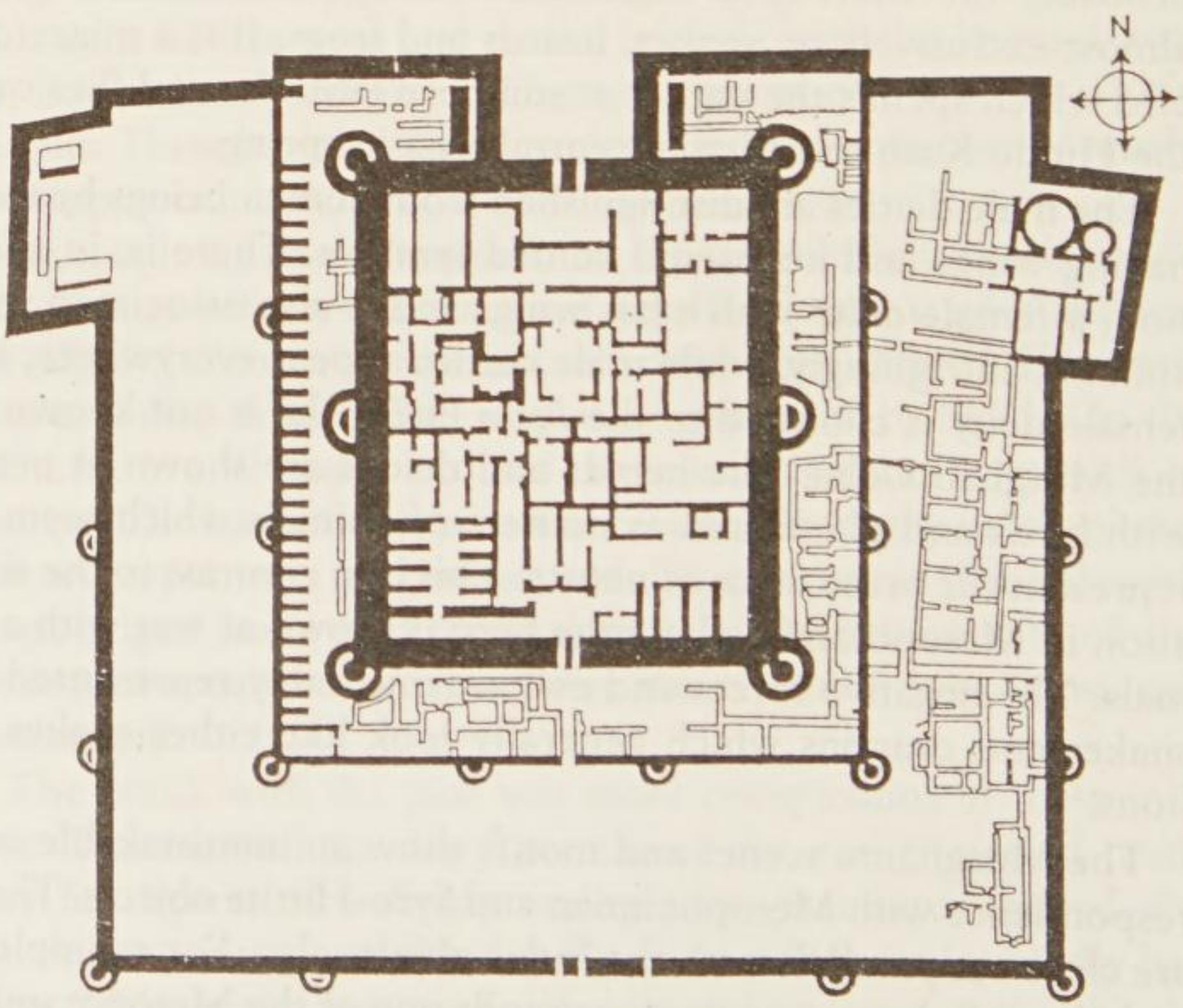


FIG. 3. The ritually significant rectangular complex at Togolok 21 in the Murghab Delta (after Sarianidi 1994, fig. 4)

northern wall, there was a central portal, flanked by two monumental pylons. One of the rooms inside the fortress was plastered white with gypsum. Along its walls were special brick platforms into which vessels were sunk. Chemical analysis revealed that the organic material from inside these vessels contained microscopic twigs of Ephedra as well as poppy. Traces of poppy were also found on the stone mortar and pestle. It seems that the purpose of the apparatus was to prepare a sacred drink.

The eastern wall of the outermost rectangular structure contained a niche near the northern corner, which had a number of connected rooms. The walls and floors of these rooms were also plastered white with gypsum, like the inner Ephedra room. The passages from the rooms led to the northern side of the niche, where two round, brick-faced altars had been dug into the earth. The smaller, flat-bottomed altar contained a half-metre-thick layer of compressed ash. It seems to have been dedicated to the fire cult. The larger altar, conical and deep, had a shell hearth in the centre, with remnants of coal. There was a large stain on its wall, suggesting that this altar was used for ritual libations.[53]

Similar structures have been found at Gonur 1 (dated 1887 BC)[54] and Togolok 1. At Gonur 1, the vessels contained remnants of poppy and cannabis, in addition to Ephedra.[55] It is noteworthy that while Ephedra has been identified with the Soma/Haoma plant of the Ṛgveda and Avesta (chapter 6), there is no indication of the use of poppy and cannabis in these texts. In the Ṛgveda, one drank Soma to keep awake; addition of poppy to the drink would have the opposite effect.

DASHLI 3 AND THE "DĀSA" FORT

In the Dashli Oasis in north Afghanistan (map 12), the Dashli 1 site housed a large fort, similar to the ones in the Murgab Delta. It was a square structure, 100 m × 100 m, with 3 to 4 m thick mudbrick walls, and circular and semicircular turrets. The interior was a maze of small rooms, lacking any overall planning. On the ruins of the Dashli 1 fort stood a cemetery containing 10 graves. Two ritual burials of complete rams accompanied by ceramic vessels were also found.[56] Two calibrated radiocarbon dates are available for Dashli 1: 1818 BC and 1443 BC. They are however

not from the earliest levels. The neighbouring site of Dashli 2 has been placed at 1619 BC.[57]

At Dashli 3, some 3 km away from Dashli 1, two public buildings were found, one rectangular, the other circular. The rectangular building, measuring 84 m × 88 m, consisted of a central courtyard surrounded by a large number of rooms and a small house with niches that served as altars. Numerous pilasters decorated the outer walls. The circular building, placed within a 140 m × 140 m square structure, consisted of three concentric circular walls (figure 4). The space between the walls was haphazardly filled with rooms. In one of the rooms in the central part, two opposite walls had decorative niches, while the other walls had large niches with traces of burning. Unlike the Murghab Delta buildings, the buildings at Dashli 3 show no traces of Ephedra.[58]

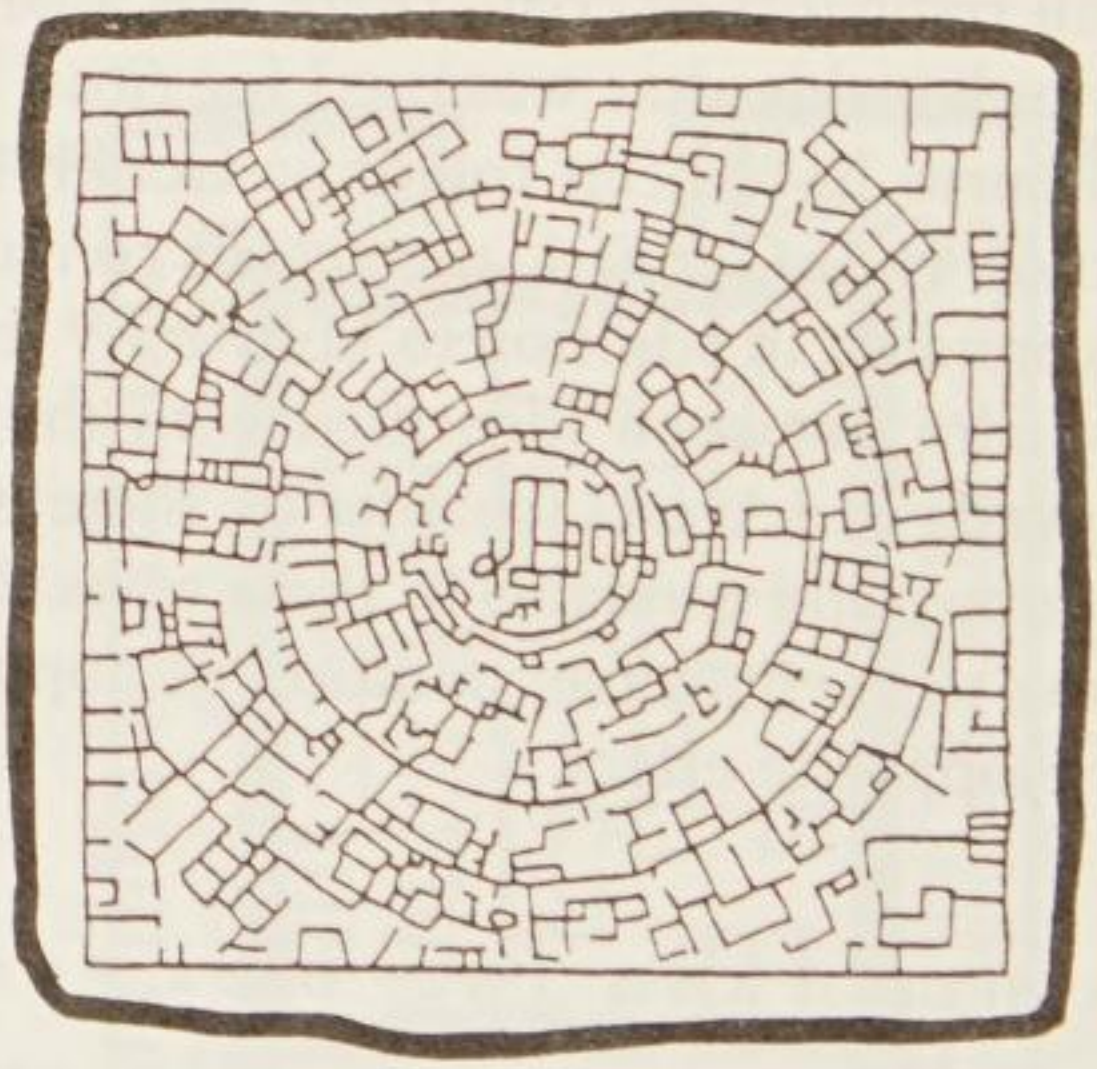


FIG. 4. The circular building at Dashli 3 in the Amu Plain, believed to correspond to the Ṛgvedic description of the Dāsa fort (after Parpola 1988, fig. 11b)

On the edge of the site, a scattered burial ground containing five graves was found. There was another cemetery atop the ruins of the circular building, containing 87 graves. The upper parts of the graves have been destroyed by erosion. Burials on the

edge of the site were simple pits covered with bricks.[59] The bodies were placed in a flexed position (in the steppe style) and oriented to the north, accompanied only by pots. In the graves located within the circular building the method of burial was the same, but the dead were accompanied not only by ceramic vessels but also metal pins, mirrors, bracelets, rings and stone vessels. In the circular building there were also cenotaphs that contained a large number of pots.[60]

A number of calibrated radiocarbon dates are available from Dashli 3. The square building has provided dates ranging from 2879 BC to 1516 BC. From outside the circular building comes the date 1740 BC; from within 1350 BC.[61] This last date may belong to burials after the circular building was abandoned. A similar but later circular building has been found at Jarkutan, north of the Amu (map 12).

A massive square edifice with turrets, dated 1200 BC, has been discovered at Tilliya-tepe, south of the Amu, underneath a village dated 350 BC. "Inside, within a double line of columns stood a mud-brick altar coated with ashes. Surely this was a temple for the worship of fire."[62]

The Dashli 3 concentric circular building seems to fit the Ṛgvedic description of the citadels (puraḥ) of the Dāsas, Dasyus and Pāṇis (collectively called Dāsas in the following). The Dāsas were the enemies of the Ṛgvedic people (chapter 5). The Ṛgveda describes them as anti-Soma; this seems to be consistent with the absence of traces of Ephedra in the circular building. There are differences, though. The Ṛgveda calls the Dāsas, Pārāvatas, the mountain people, while the Dashli 3 building is located in the plains. Dashli 3 seems to represent the pre-Ṛgvedic memories of the Ṛgvedic people (chapter 9).

While the Murghab Delta and Amu Plain display the same material culture, there are important differences in the cultic practices. The cult of fire was common to both the sub-areas, but the Ephedra cult was confined to Murghab Delta alone. Similarly, while the male and eagle-man deities were common to both, the female deity was exclusively an Amu Plain artefact. One wonders whether the inhabitants of the Amu Plain were the Indo-Iranized natives of Namazga V vintage who did not integrate fully. They adopted the fire cult but not Ephedra. They

perhaps invented a female deity in continuation of their earlier beliefs. The Ṛgvedic reference to their noselessness might have been a negative comment about their physical features. No matter what its relationship with the textual material, the Murghamu culture spread to the whole of Greater Iran and even moved eastwards into India.

While the Zaman-Baba and Murghamu cultures were the result of a synthesis of the steppe cultures with the sedentary cultures, there was another cultural stream in central Asia, explicitly associated with the Andronovo culture.

The Andronovans appeared on the ancient delta of the Amu Darya (Khorezm), where they gave rise to the Tazabagyab cultural variant, as seen in the Kokcha 3 cemetery[63] (map 12). Here the body was buried in a shallow pit, in a flexed position with the head nearly always towards the west. A distinction was made on the basis of sex: the males were laid on their right side, the females on their left. Very often, the grave was opened to co-bury the spouse. The grave goods included a few pots, placed at the head, and jewellery of various kinds including bronze beads, and pendants and bracelets for women. The pottery resembles that of the Alakul variant of the Andronovo culture as well as the pottery of the Timber Grave culture.

The Tazabagyab economy depended on stockbreeding and irrigated agriculture. The bones of cows, sheep and, occasionally, horses have been excavated. (In addition, the clay figure of a horse was found with a hole through its mane, as also small wheels near by. This suggests that these were parts of a model of a horse-drawn cart.) Traces of irrigation ditches were found some 150–200 m away from several natural channels of the delta. When a channel dried up, a canal was dug alongside it, repeating all its bends in order to take water to the fields.

Along these channels stood the villages themselves, comprising three to ten houses. A house was rectangular in shape, measuring 50–80m², with the floor slightly sunk in the ground. The roof was supported by wooden posts and a large rectangular hearth occupied the centre. Seen from the size of the room, it appears

that it served as the dwelling unit for the entire clan. This is in contrast to the practice in the southern sedentary cultures of Greater Iran and India where a house was meant for a single family.

The lower reaches of the Zerafshan, which earlier had seen the Zaman-Baba culture, were later occupied by the Tazabagyabians. At the Gudjaili cemetery, like in Kokcha 3, bodies were placed on their left in a flexed position, with the head pointing west. The discovery of metal slag testifies to local metal working, but the Gudjaili artefacts resemble those from the southern Urals. Several burials of the period have been discovered at Muminabad in the Samarkand Oasis, on the upper Zerafshan.[64]

VAKHSH CULTURE

Two Bronze Age pastoral cultures, which are known from burial sites, are particularly important: the Vakhsh culture[65] on the lower reaches of the Vakhsh and Kyzil-su Rivers; and the Bishkent (or Beshkent) culture in the Bishkent Valley of the Kafirinigan River. Burial sites of the Vakhsh culture are visible on the surface by virtue of mound-like artificial barrows (kurgans or tumuli)—0.1 to 1.1 m high, circular or slightly oval in shape, made of loess (wind-blown dust), to which sometimes pebbles or stones were added. Most of the barrows are surrounded at the base by a ring of stones arranged horizontally in one to four rows. Sometimes the ring is situated up the slope of the barrow. Some tumuli are ringed by a further outer circle of stones, 9.5–30 m distant from the base of the barrow. Five sites of the Vakhsh culture have been fully or partly excavated. The largest cemetery, at Tigrovaya Balka (map 12), measures 680 m × 800 m and contains 130 tumuli, 116 of which have been excavated. A single calibrated radiocarbon date from this cemetry reads 1625 BC.[66] The other cemeteries are Vakhsh I, size 180 m × 280 m, number of tumuli 50, excavated 40; Oikul, 200 m × 260 m, 52 tumuli, all excavated; Jarkul, size 240 m × 250 m, 80 tumuli, 13 excavated; and Makan-e Mir, size 200 m × 300 m, 40 tumuli, 12 excavated. Remarkably, all the tumuli that have been investigated are similar in their mode of burial and the composition of the grave goods.

The structure of a burial site was as follows: First, a sloping passage was dug out below the ground level. Then a grave

chamber was cut out on one of the walls of the passage. By common usage, if the chamber is in the long wall it is called a niche; if in the short wall, a catacomb. The niche or the catacomb was then used for burial and the entrance passage sealed with large cobblestones and loess. The body was almost always placed in a crouched position on the side, with arms folded at the elbows and the legs at the knees. The body lay directly on the floor of the chamber, whose depth below the original ground level varied from 0.8 to 3 m. In some cases, the head was placed on a rectangular clay pillow. The orientation of the body varied; in about 30 per cent of the cases, it was towards the north and least frequently towards the south.

Most of the burials were single, though there were some double burials, of the same sex or both the sexes. In some cases, a woman was buried with a child. Some of the pairs were buried at the same time, others at different times by opening the graves. In the case of single male burials, the body was typically placed on its right side, facing the entrance to the burial chamber. Females were placed in different positions, the commonest (half the cases) being on the left side.

The cult of fire is seen associated with the funerary rites only in 25 per cent of the graves. In some cases, a fire seems to have been lit outside the tomb, with charcoal and embers brought in braziers. In no case is there any sign of a fire being lit in the passage to the chamber. In other cases, a fire was lit at the original ground level, before soil was heaped to form a barrow. In the case of two "chiefs" buried in the Tigrovaya Balka cemetery, the tomb was surrounded by a ring of pyres, consisting of 41 individual pyres in one case, and 20 in the other. There are a great number of cenotaphs in the Vakhsh culture, in which the dead were often replaced by raw-clay figurines. One grave contained a body without a head; and another contained only a head. This may indicate the possible practice of human sacrifice.

The grave goods primarily consisted of pottery. Only in as few as 5 per cent of the cases (14 tumuli out of 233), metal artefacts like daggers, mirrors and knives were found. Over 70 per cent of the pottery was handmade. In many cases, the handmade and wheel-made pottery were identical in shape and even in dimensions. It is significant that the Vakhsh pottery and artefacts are

related to those used by the sedentary cultures in north Afghanistan. It is likely that the Vakhsh culture was the result of the synthesis of the steppe tribes with the Murghamu cultural elements. The picture, however, is not clear. If the Vakhsh culture came from the Andronovans, who were experts in metallurgy, then the rarity of metal in Vakhsh is surprising. Furthermore, 19 per cent of the ceramic material is of a type unknown among both Andronovans as well as the southern agriculturists. It is also notable that there was no trace of the horse in these cemetries.

BISHKENT CULTURE

Bishkent Valley occupies a small geographical area but shows a variety of cultural traditions, with clear signs of Vakhsh intrusion and influence. The Bishkent culture[67] itself is defined from the majority of graves of the early Tulkhar cemetery (map 12). A fundamental difference, however, is noticeable between the Vakhsh and Bishkent cultures. In the Vakhsh, the fire cult was optional; in the Bishkent obligatory. In every case, fire was present, as evidenced by distinctive small hearths in the graves. In male burials the hearth was square; in female, round. When the body was buried, a fire was lit in the hearth. The Bishkent cemetries, unlike the Vakhsh, contained no cenotaphs.

A typical Bishkent-culture grave consisted of an inclined descent leading to a quasi-rectangular or rounded pit with the long axis often aligned along the east-west direction. Most of the burials were single. There were however eight pair-burials (all of both sexes), some buried at the same time, others at different times. Four of the tombs contained multiple child burials; these tombs were located at some distance from the adult cemetery. From the outside, all tombs are visible as a covering of stones.

In the Bishkent graves, the bodies were hunched up, with arms bent at the elbows, legs at the knees. Men were laid on their right and faced the entrance. Women were laid on their left, either facing the entrance or with their backs to it. In pair burials, the woman always faced the man and thus had her back to the entrance. The two heads pointed to the east. In single burials, however, the bodies were oriented randomly. The grave goods consisted of pottery as well as metal and stone artefacts. About 70 per cent of the pottery was handmade.

Three graves constitute a separate group. Here a rectangular grave chamber was hollowed out in the centre of the pit. Its walls and floor were then lined with flagstone chippings to form a box. In this box were buried the bones of the dismembered skeleton. The skull was always placed in the eastern part of the box, leg bones in the western, the arm bones between them, and the other bones underneath. This open box was then covered with reed. There were no grave goods.

There was yet another type of burial in early Tulkhar, seen in two cases. The bodies were laid in a crouched position, with the usual man-woman distinction. Around the skull, a narrow band of ashes and charcoal chips was noticed. This indicates that a fire was lit in the tomb for ritual purposes. The grave goods consisted of vessels, round mirrors and sheep bones. The grave was surrounded by a roughly squarish array of stones, with the cornerstones being extremely large.

A group of nine graves followed a different practice. Here, first a shallow pit was dug, usually in the north-south direction. At the southern end, an oval grave chamber was further dug. On its floor were placed the cremated remains of the body. The chamber was then covered with flagstone chips or elongated stones. The (upper) pit was then laid with stones arranged in the form of a svastika or a four-spoked circle. The pits have yielded small fragments of ill-fired pottery, from which the shapes of the original pots cannot be reconstructed.

This particular funerary practice seems to correspond to the Ṛgvedic description in a hymn (Ṛv 10.18) devoted to Mṛtyu, that is Death. Ṛv (10.18.13) says, "I keep off the earth above thee with thy lid, while over thee I place this piece of earth." This points towards covering the remains of the dead with a stone lid before filling the pit with earth. In other types of Bishkent or Vakhsh burials, where the graves were directly filled, the question of "keeping off the earth" would not arise.

The significance of the stone ring around the grave becomes clear from Ṛv (10.18.4): "Here I erect this rampart for the living; let none of these, none other, reach this limit. May they survive a hundred lengthened autumns, and may they bury Death beneath this mound." The stone ring was thus a boundary separating the living from the dead, and limiting the jurisdiction of death to the area within the ring.

XINJIANG MUMMIES

Before leaving central Asia, it is instructive to examine evidence from the Xinjiang province. Here more than 100 corpses have been unearthed by Chinese archaeologists over the past 17 years, from four major sites scattered between the arid southern foothills of the Tian Shan ("Celestial Mountains") and the fringes of the Taklamakan Desert[68] (map 10).

These bodies dating from about 2000 BC to 300 BC were not consciously mummified. Their preservation came about as a result of their being buried in the stony desert. In the heat, the bodies quickly dried, with the facial hair, skin and other tissues remaining largely intact. From their features, the dead have been identified as Indo-European speakers. It is tempting to connect them with the later-day Tocharian speakers, who occupied the same general area.

The oldest mummies have been unearthed from the area around the now-dried up Lop Nor Lake, about 450 km southeast of the city of Urumqi. At Loulan on the shores of this lake, a corpse of a blondish/brown-haired woman has been found and has been dated about 2000 BC. She is dressed in wool; her boots are of leather, sewn with raw hide. On her right, in the grave, was a basket containing wheat grain; on her left, a winnowing basket.

The Peacock River area about 65 km northwest of the Lop Nor has yielded a corpse of an eight-year-old child dated c. 1700 BC. The decorative pins used to close the child's wrap are made of bone. Another corpse from the area and from the same period is that of a woman, wearing a felt hat and covered with a woollen shroud.

Particularly rewarding has been the site of Qizilchoqa, "Red hillock", on the banks of a stream in the Tian Shan. A total of 113 graves have been excavated here; probably an equal number remain to be explored. Based on radiocarbon dating and the style of painted pots, all the mummies here appear to date back to about 1200 BC. Expectedly, the bodies were found flexed but lying on their backs. The bodies were fully clothed in brightly coloured woollen fabrics, felt and leather boots, and sometimes leather coats. The men generally had light brown or blond hair and the women had long braids. One girl had blue tattoo marks on her wrist. Many mummies carried a tattoo mark depicting the

sun. Besides pottery, the grave goods included simple household items like wooden combs, bone needles, spindle wheels for spinning thread, hooks, bells, bread loaves and other food offerings.

An important find from Qizilchoqa is a piece of wood which once belonged to a wagon wheel. The wheel was made by dowelling together three carved, parallel wooden planks. The style of wheel making is similar to the one used in the Ukrainean steppes as far back as 3000 BC. The Qizilchoqa graves have also yielded evidence for horse riding, including, for example, a horse whip consisting of a single strip of leather attached to a wooden handle.

At the fifth-century BC site near the town of Subashi, 500 km west of Qizilchoqa, a dead woman wearing a two-foot-long, black peaked felt hat was unearthed. Such hat wearing people are known from history. In about 520 BC, the Persian king Darius recorded a victory over the "Sakas of the pointed hats". Also, in 1970 in Kazakhstan, just across China's western border, the grave of a man from about the same period yielded a two-foot-tall conical hat studded with magnificent gold-leaf decorations. Chinese texts, from the second century BC, refer to alien peoples called the Yuezhi and the Wusen, who lived on China's far western border. Although there is no way of knowing what language these people would have spoken, circumstantial evidence suggests they were Indo-Iranians.

Pāṇini (c. 450 BC) tells us that kanthā was used as an ending for names of towns in Uśīnara (lower Chenab-Ravi doab) and Varṇu (Bannu), as in Kukkutakanthā. Kanthā is a Saka word for town, cognate with Persian kand, Khotanese kantha, and Pashto kandai. Asica, the dialect of the Ṛṣikas or Yuechis, contains a similar word, kanda. In Pāṇini's time, and as seen from the inscriptions of Darius I, the Sakas lived beyond the Oxus. The old Saka land still abounds in kanthā-ending names: Samar-kand, Tashkent, Panj-kand, Yar-kand, and so on. The Mahābhārata speaks of Śakas living in Śakadvīpa and mentions its geography: Cakṣu (Oxus), probably an alternative reading of Vakṣu,[69] Kumud (Komedai of Herodotus, a mountain in the Saka country), Himavat (Hencodon Mountain), Sītā (Yarkand River), Kaumara (Komarai of Herodotius), Maśaka (Massagetai of Strabo), Ṛṣika (Asioi), and Tuṣāra (Tokarai).[70]

The Sanskrit term Vakṣu, cognate with Vakhsh, figures in Varāhamihira's Bṛhat Saṃhitā (sixth century AD), and as Vankṣu in the Mahābhārata.[71] It does not find mention in the Ṛgveda. The Ṛgveda, however, does mention Rasā which apart from being a tributary of the Indus (chapter 7) is also referred to as a mythical river—known to the Avesta as Ranha. One wonders whether the mythical river commemorated the Amu, which the Ṛgvedic and Avestan people had left behind.[72] Significantly, as we shall see, the Bishkent cultural elements are recognizable in the finds from the valleys of the western tributaries of the Indus.

9

ṚGVEDIC PEOPLE AND OTHER INDIC SPEAKERS

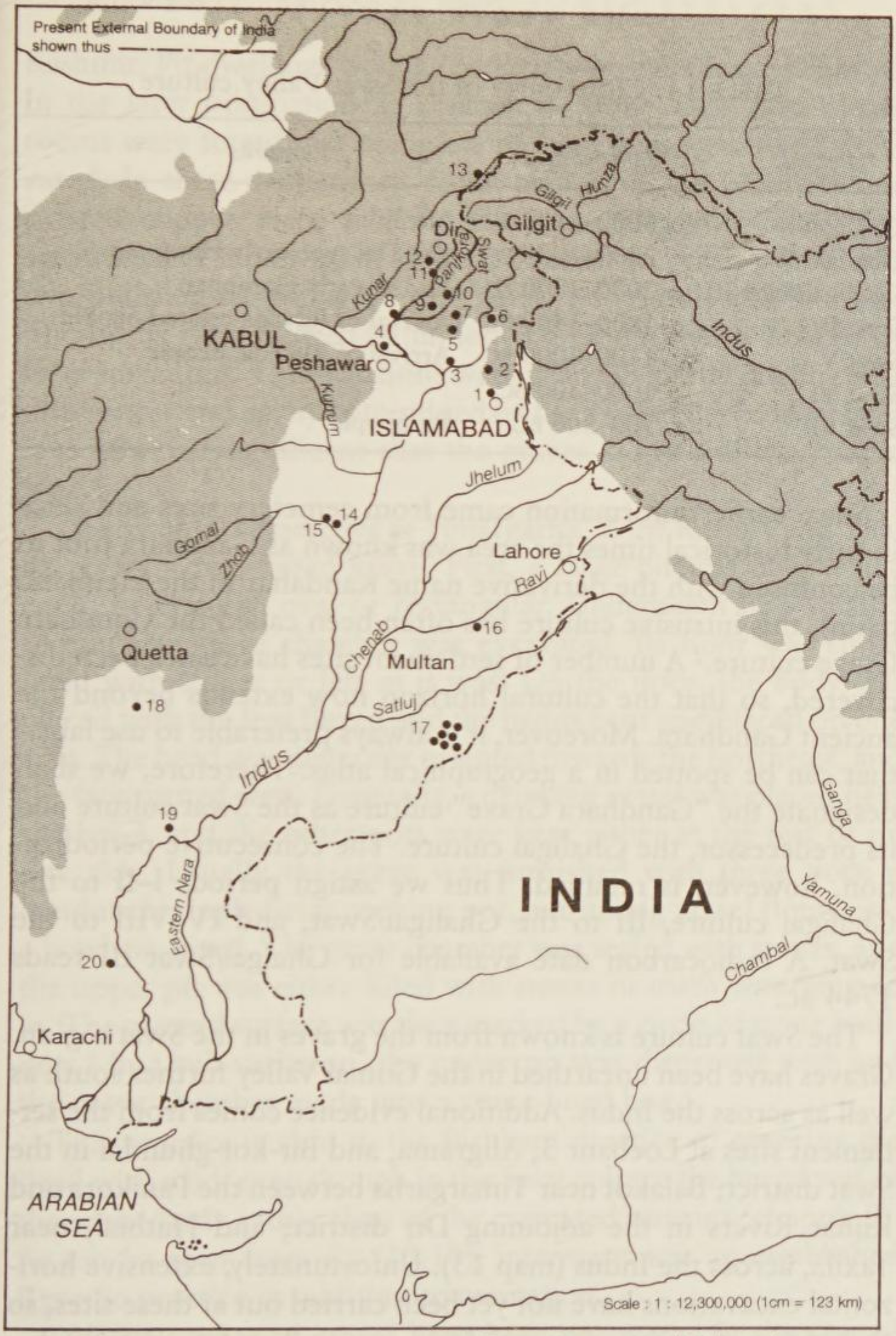
Anyone who isn't confused doesn't really understand the situation.

—Ed Murrow

In the discussion so far, all archaeological evidence believed to be connected with the Indo-Iranian speakers has come from territories not explicitly known to the Ṛgveda. The former Soviet Central Asia has been thoroughly investigated archaeologically. South Afghanistan, however, remains largely unexplored. Direct evidence attributable to the Ṛgvedic people comes from the valley of the Swat (Ṛgvedic Suvāstu) which joins the Kabul (Kubhā) before flowing into the Indus; from the Gomal (Gomatī); and from the area across the Indus.

SWAT CULTURE

The archaeological remains from the Swat Valley (map 13) and its neighbourhood span the time bracket c. 3000–300 BC, divided into seven periods[1] (table 14). The earliest evidence comes from the Ghaligai rock shelter. The first two periods are clearly "native". While period I (c. 3000–2500 BC) belongs to the neolithic era, period II (c. 2500–2000 BC) is characterized by a fine, painted, wheel-made pottery related to the Kot Diji type of early Harappan culture. The next short period, III (c. 2000–1800 BC), was a period of transition, during which the Harappan-style pottery completely disappeared to be replaced by a rather coarse pottery. The following period shows a clear discontinuity with the earlier periods and is ascribed to Indo-Iranian speakers, which may now be designated Indic speakers. As already noted (chapter 3), this area is now inhabited by speakers of Dardic and Kafiri languages.



1 Taxila, Hathial
2 Sarai Kala
3 Panchpir
4 Zarif Karuna
5 Loebanr, Butkara II, Katelai
6 Kherai
7 Aligrama
8 Ghaligai
9 Thana
10 Saidu
11 Timargarha
12 Balambat
13 Chitral
14 Gumla
15 Hathala
16 Harappá
17 Cemetery - H sites
18 Pirak
19 Jhukar
20 Jhangar

MAP 13. Sites belonging to the Swat culture and the late Harappan phase (after Dani 1992, map 12)

TABLE 14: Chronology of the Swat Valley culture

Period	*Time bracket*	*Remarks*
Ghaligai I	c. 3000–2500 BC	Neolithic
Ghaligai II	c. 2500–2000 BC	Kot Diji type early Harappan
Ghaligai/Swat III	c. 2000–1800 BC	End of early Harappan
Swat IV	c. 1800–1400 BC	Arrival of Ṛgveda-related people
Swat V	c. 1400–1000 BC	Arrival of Ṛgvedic people
Swat VI	c. 1000–500 BC	–
Swat VII	c. 500–300 BC	Ṛv people?

Since earlier information came from cemetery sites and since in early historical times the area was known as Gandhara (not to be confused with the derivative name Kandahar in the Helmand basin), this intrusive culture has often been called the Gandhara Grave culture.[2] A number of settlement sites have since been discovered, so that the cultural horizon now extends beyond the ancient Gandhara. Moreover, it is always preferable to use labels that can be spotted in a geographical atlas. Therefore, we shall designate the "Gandhara Grave" culture as the Swat culture and its predecessor, the Ghaligai culture. The consecutive periodization, however, is retained. Thus we assign periods I–II to the Ghaligai culture, III to the Ghaligai/Swat, and IV–VIII to the Swat. A radiocarbon date available for Ghalgai/Swat III reads 1744 BC.

The Swat culture is known from the graves in the Swat region. Graves have been unearthed in the Gomal Valley further south as well as across the Indus. Additional evidence comes from the settlement sites at Loebanr 3, Aligrama, and Bir-kot-ghundai in the Swat district; Balakot near Timargarha between the Panjkora and Kunar Rivers in the adjoining Dir district; and Hathial, near Taxila, across the Indus (map 13). Unfortunately, extensive horizontal excavations have not yet been carried out at these sites, so that more information comes from graves than from houses.[3]

Like at Kokcha 3 on the lower Amu, the Loebanr 3 houses were subterranean. Two large-sized pit dwellings were oval shaped, while several smaller pits were of different shapes. Shallower pits were found at the related sites of Aligrama, east of the Swat, and Sarai Kala, east of the Indus, and deeper pits at Burzahom in

Kashmir. Pit dwellings were a protection against the cold climate. In the later occupation at Loebanr 3, stone walls and square rooms were found, but complete buildings have yet to be excavated. In these settlements, metal objects were rare. Only one twisted copper piece was found. (Later occupants used iron arrowheads.) Other small finds included two green jade beads, two polished-stone axes, a ring stone, bone tools and hairpins. The burial rites showed an underlying homogeneity, broken by local variations. The variations were probably partly due to cultic differences and partly determined by the availability of materials. It is however significant that the graves are not of the kurgan type.[4]

The Swat IV cemeteries at Timargarha, Zarif Karuna and Thana reveal a two-tiered grave. First, a large pit was dug, which could be circular, oval or rectangular. Underneath it, a smaller rectangular grave chamber was excavated. Its floor was either lined with stones or left as it was. On the floor, the body was placed with the legs flexed and the hands bent and placed on one side. The head was generally oriented towards the northeast, and the face turned west. Generally, a drinking vessel was placed near the hand, and the other pots were kept either at the feet or on one side. Usually the grave was furnished with three pots: a handmade rippled-rim cooking pot, a drinking vessel (lota), and a bowl-on-stand. The grave chamber was sealed with stones, and the upper pit was either filled with stones or earth was rammed in. The ground surface was then marked by a circle of stone boulders.[5] In a sub-variation, the upper pit was dispensed with and the grave chamber made into a stone-lined box.[6]

This practice is akin to the Bishkent practice of covering the dead with a lid, even though in the Swat culture the burial was of the entire body rather than of the cremated remains (chapter 8). As can be seen from Ṛv (10.18), interment was an established Ṛgvedic practice in addition to cremation.

Different types of graves have been uncovered in the Gomal Valley at Hathala, Gumla and Marha Sharif. In the oldest Gomal Valley graves, a circular pit, about 1.5 m deep, was dug. In the middle of the pit, probably above a scatter of wood, killed animals were placed. They were covered with wood and loose earth. The pit was then filled with clay. On this clay filling, the dead

body was placed along with grave goods. The grave was then sealed with clay and a fire lit on top. The grave goods included terracotta bangles, clay bulls and horses, female figurines, saucers, hubbed wheels and microlithic flakes.

During period V, the body was cremated and the burnt bones and ashes were placed in jars of various kinds. One kind was a tub-shaped urn which was open at the top and was later covered by another pot with three or six holes in the sides. An alternative container was a visage urn, which imitated a human face, with a representation of a nose, two eyes and a mouth. It was covered with a handled lid and placed upside down. Sometimes the human face appeared on a globular jar. All these jars were placed inside the burial pit along with other pots, copper pins, beads and gold ornaments. The face urn was a new feature in central Asia. The only known parallels are in the Trans-Caucasia in the third millennium BC, in the Danube area in c. 1500 BC, and with some differences in Sialk B.[7]

In the later (Iron Age) graves, the body was aligned north-south with the head towards the north. The upper part of the body, from shoulder to hip, lay flat on the ground but the head was slightly tilted to the east. The legs were flexed with the left leg crossed over the right. The right hand lay straight by the side of the body, whereas the left hand went across the body towards the right palm. The mouth was wide open. A single terracotta bull was found below the hip. Generally, such burials were not accompanied by any grave goods.

At far-away Sarai Kala, on the banks of the Kala rivulet, near Taxila, two types of graves have been excavated atop a mound which bears Kot Diji type, early Harappan material. Both these types belong to the Iron Age. In keeping with the times, there were no grave goods, except for two iron rings and some fragments of paste bracelets. In the first type (57 graves), the top of the grave was flush with the ground and marked by two stones, one at the head and the other at the foot. In the second type (65 graves), the grave was sealed with large and medium-sized river pebbles. The burial custom was the same in both the cases.

A characteristic feature of the burial custom was the importance attached to the deceased's age and sex. The bodies were buried naked, with mouths gaping as in Gomal. In the case of

men and boys, and all children, one leg was slightly bent so that one foot touched the other ankle. The hands of men and boys were stretched parallel to the body. In the case of an adult woman, one hand was placed in the pelvic region while the other arm was stretched parallel to the body. In the case of girls, one hand covered the pelvic region, while the other either covered the breasts or the midriff.[8]

To sum up, certain broad conclusions can be drawn about the Swat culture. The settlements were located on hilltops or slopes generally not far from rivers. The houses were either subterranean or stone-built. A number of similar but not identical burial customs were in vogue. The practice of placing grave goods seems to have been a Bronze Age phenomenon, which came to an end in the Iron Age.

A large number of pot forms were in use, varying from hand-made pottery to grey-and-red, wheel-made pots, sometimes burnished and mat-impressed and very occasionally, painted. The forms included cooking vessels, dinner plates (thalis), bowls, drinking vessels, bowls-on-stand, bowls and cups on pedestals, bottles, water pitchers, globular jars, vessels with handles, and jars with pinched mouths. In addition, there were pots for ritualistic use: visage urns and burial tubs. These pot forms show a pattern of life different from the Harappan civilization and are more appropriately related to a rural setting.[9]

While there is enough circumstantial evidence to relate the Swat culture with the Ṛgvedic people, it is intriguing that no remnants of this culture have been found on the Punjab rivers which are also named in the Ṛgveda.

THREE WAVES OF INDIC SPEAKERS

We can distinguish three waves of Indic speakers who entered the Indian subcontinent at the end of the mature Harappan phase. The first two waves are dated c. 2000–1800 BC, whereas the third one took place in c. 1400 BC.

i. The Murghamu-related people entered Baluchistan where their presence is recorded at Pirak, Mehrgarh south cemetery, Sibri, Shahi-tump, Rana Ghundai III–IV, among other sites. They merged with the post-urban Harappans to found the late

Harappan Jhukar phase in Sind and Rangpur phase in Kutch and Saurashtra. They even made their appearance in the Aravali Hills, as evidenced at the non-Harappan site of Ahar on the outskirts of Udaipur.

ii. The Swat IV people, culturally similar to, but not identical with the Ṛgvedic people, co-founded the late Harappan Cemetery H phase in Punjab.

iii. The actual Ṛgvedic people were the authors of the Swat V culture (c. 1400 BC), who subsequently absorbed the Cemetery H people and gave rise to the PGW culture.

We now discuss the relevant evidence in some detail.

Baluchistan and Sind

Evidence connecting Baluchistan with Greater Iran has been accumulating for a long time. But it is only now that it has become possible to place it in perspective. The most complete evidence comes from Pirak, at the foot of Bolan Pass, which shows unbroken occupancy for a 1000-year span right up to the Iron Age (map 13). This span has been broken into three periods: I (c. 1900–1300 BC), II (c. 1300–1100 BC) and III (c. 1000–900 BC). From periods I and II come distinctive figurines of two-humped camels as well as of horses and horse riders. The camel figurines were quite new in the Indus Valley, but had close parallel in the Murghab Delta. The horseman had bowed legs to fit them on the back of the horse. They had armless torsos and beak-like faces.[10] The beaked horsemen appear to have been modelled on the eagle-man deity of the Murghamu culture.

Camel and horse bones have been found, but unlike those of cattle, sheep and goats, they were rare. This suggests that the camel and horse were primarily used for transport and not as food items. The Pirak data furnish the earliest firm evidence for the domesticated horse in south Asia. Pirak has another first to its credit. It is the first site where rice was the major crop.[11]

A cemetery south of Mehrgarh has revealed four types of funerary material: graves containing skeletons and grave goods; cenotaphs, with grave goods but no skeletons; isolated deposits of material either in pits or just lying on the natural soil; and large jars placed upside down, generally in association with one

or two small jars. Near by lies the settlement site of Sibri with an area of at least one hectare. The archaeological deposit is no more than 1–1.5 m thick and some of the remains, especially fireplaces, are even visible on the surface.[12]

Mehrgarh south cemetery and Sibri define the Mehrgarh VIII period which differs markedly from period VII (chapter 5). There was now a distinct improvement in the quality of copper/bronze artefacts as well as in their number. These objects, including a shaft-hole axe-adze, find ready parallels in objects from Greater Iran.[13]

Advances in metallurgy were accompanied by a decline in ceramics. At Sibri, the quantity of pottery decreased and painted decorations almost disappeared. In addition to the finer, wheel-turned pots, coarse, handmade pottery came into use. One can discern a duality of purpose in the production of pottery. Broadly speaking, fine wheel-made pottery was meant for the dead, even if there were other uses for it, while coarser handmade pottery was used in everday life.[14]

The pottery shapes in both cases are similar to the ones in use in central Asia. The most interesting finds from Sibri are the seals which are of two types. The principal kind is the compartmented seal made of bronze or stone. Three of these are triangle-shaped. The second type is represented by a single piece. It is a black steatite cylinder with a pierced boss on top and an engraved scorpion at the base. The face of the cylinder depicts a zebu facing what is probably a lion. This cylindrical seal was found in association with two black steatite beads, and together they may have formed part of a necklace. The cylindrical seal is very similar to the seals found at Taip in the Murghab Delta.[15]

At the Harappan site of Nausharo near Mehrgarh and Sibri, in the final phase of period II, mature Harappan objects were accompanied by distinctive plain pottery similar to the one seen, for example, at Sapalli-tepe in the northern Amu Plain.[16] At Rana Ghundai in the Loralai Valley, five occupational levels have been identified, with period I being at the bottom. Period III came to an end with a conflagration, while the following period IV was characterized by an entirely new type of pottery. The end of period III must be attributed to the new arrivals. Period V again brought in a new set of people, as can be inferred from the change in the pottery decoration techniques.[17]

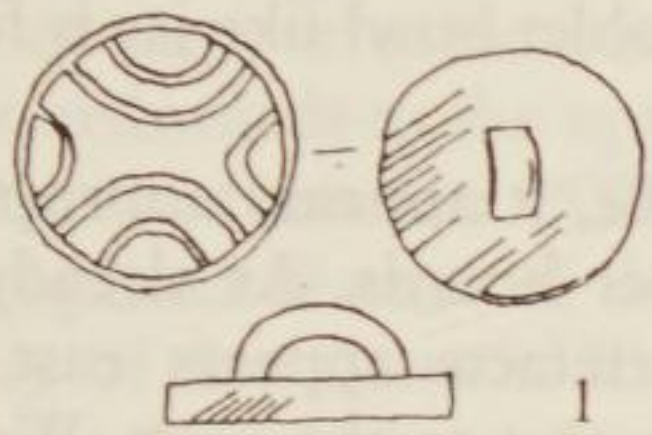
The Shahi-tump cemetery was dug into the ruins of an earlier settlement. The burials consisted of bodies placed on one side with the legs flexed. Apart from pottery, the associated grave goods included svastikas, a shaft-hole axe, a copper spearhead, compartmented seals with strap handles, besides beads of agate, ruby, lapis lazuli, and others. The shaft-hole axe is comparable to those from Maikop and Tsarskaya in south Russia, while the seals have their counterparts in Hissar II B and Anau III.[18]

There are, in addition, stray metal objects of western affiliation. Fort Munro in the foothills west of Dera Ghazi Khan has yeilded a bronze dirk with a fan-shaped decoration on the pommel of its hilt. This dirk is similar to the ones from Luristan and Sialk VI. At Shalozan, high up in the Kurram Valley, a copper trunnion axe was discovered, comparable to examples from Hasanlu and other Iranian sites[19] (figure 5).

Because of the influence of new cultural elements, the old benchmarks like town planning, seals and script disappeared from the Jhukar phase. Pottery remained substantially the same, except that a large fraction was now given finishing touches by beating, after removal from the wheel. This later became a typical Indian technique. Not unexpectedly, new equations were more positively reflected in matters technological. There were new metal objects and the sudden appearance of circular or square stamp-seals of stone or faience. All these show parallels with Baluchistan and, further west, with Greater Iran and even the Caucasus.[20]

At Chanhudaro there is no break between the final stage of the mature Harappan phase and the subsequent occupancy. At Mohenjodaro there is no direct evidence of a Jhukar phase. Groups of hastily buried or unburied corpses at Mohenjodaro have often been interpreted in terms of a raid by foreigners (chapter 5). Even if it was so, probably ecological factors like waterlogging discouraged newcomers from settling down at Mohenjodaro. The pattern seen in Sind is broadly repeated in Kutch and Saurashtra. The late Harappan Rangpur phase is marked by changes in ceramics, abandonment of mature-period sites, and construction of new settlements which were smaller and fewer.[21]

The non-Ṛgvedic Indic speakers seem to have come right up to Aravali Hills in east Rajasthan. In the Banas Valley sites like Ahar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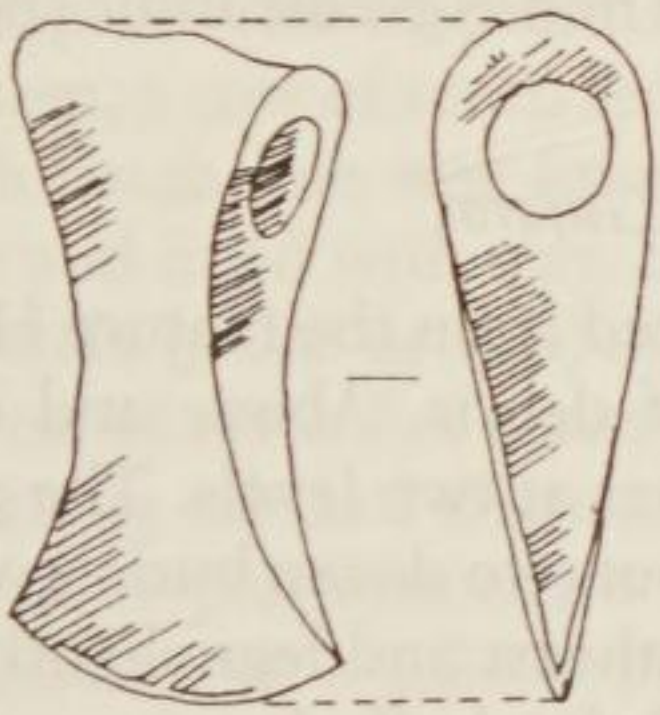
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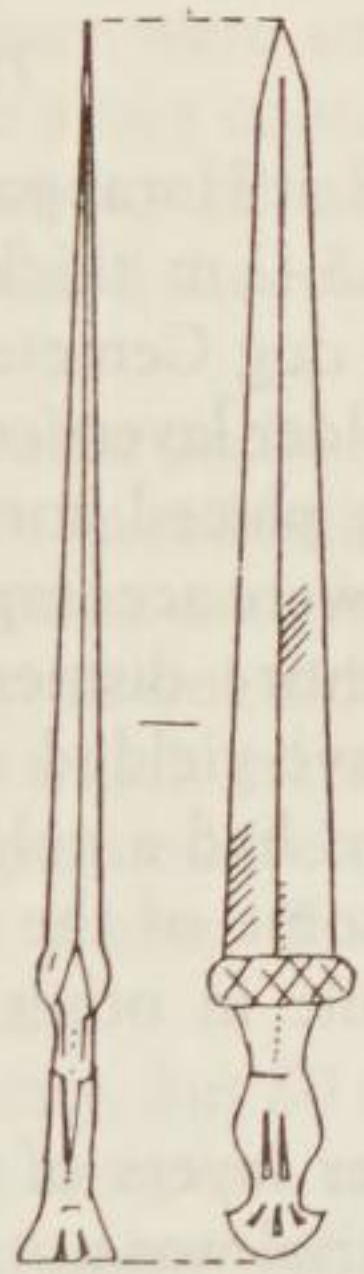
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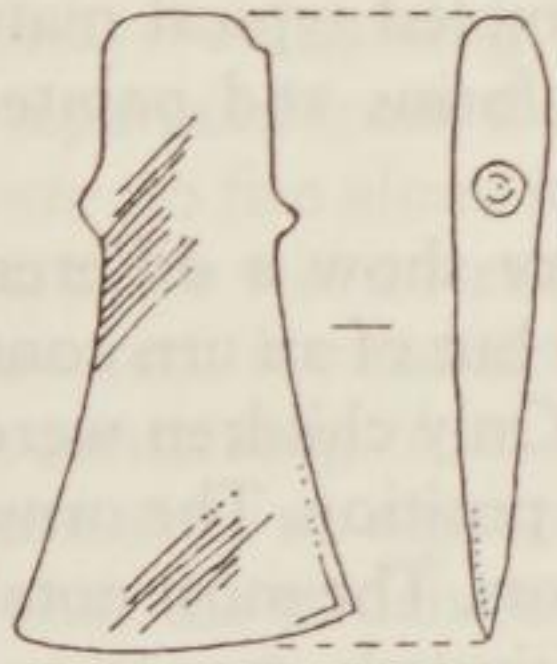
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FIG. 5. Artefacts from northwest India showing affiliation with Greater Iran. 1 and 2: compartmented copper seals in Shahi-tump; 3: copper shaft-hole axe in Shahi-tump; 4: copper trunnion axe in Shalozam, Kurrum; 5: bronze dirk from Fort Munro, near Dera Ghazi Khan (after Lal 1953, figs. 1–4).

and Kayatha, there are no signs of mature Harappan or Jhukar phases, but there is some connection with Greater Iran. The goblet on a hollow stand and a bottle-like vessel that are seen at Ahar also occur at Hissar III, while the goblet bowl-like jar is found at Shah-tepe also.[22]

In the light of the above evidence, it appears appropriate to examine the question of the copper hoards. As already noted (chapter 5), one set of copper artefacts appears east of the Yamuna-Ganga (Yaga) doab; another set to the west. We would like to suggest that while the eastern hoards were the handiwork of local cultures, the western artefacts with clear-cut Greater Iran affiliation were the property of the non-Ṛgvedic Indic speakers.[23]

Punjab and Gujarat

Cemetery H at Harappa is separated from the mature Harappan levels by 1.5–2 m thick layers of debris. Above and into this debris were dug Cemetery H graves at two levels. The graves in the lower, older layers contain about two dozen burials with bodies normally placed northeast-southeast and legs slightly flexed. The bodies were accompanied with food offerings in pots. In one grave, an entire dismembered goat was laid with the corpse. Another grave yielded a gold bangle on the wrist of a woman, while a third had a gold wire looped around three loose teeth. Pottery in some of the graves resembled typical mature-period pottery, while in other cases, pot forms and painted patterns were new.

The upper layers of the cemetery show a different pattern. Here the burial was not of the body but of an urn containing the skull, a few large bones and ashes. Only children were placed in the urn complete, in the embryonic position. The urns were covered with the lids or fragments of pots. The most notable feature of the urns is the painting of continuous scenes on them, no doubt representing some of the ideas associated with death rites. The motifs include peacocks and other birds, bulls and deer. It is clear from the pottery as well as from the decorations on it that the Cemetery H culture simultaneously represents a continuum with the mature Harappan phase and the arrival of new elements.[24]

Cemetery H-type pottery has been recorded at about 50 sites on the lower Ghaggar (Hakra), in Bahawalpur. This number is

barely one-third of the number of mature-phase sites in the area, most of which were abandoned in favour of new settlements. The number of exclusively industrial sites went down, while the number of camp sites increased. In about 1700 BC, these people moved northwards to the upper Ghaggar where they were eventually absorbed into the PGW culture.[25]

An enigmatic feature of the Harappan tradition has been the discovery of fire altars at Kalibangan and Lothal, and of horse bones in Surkotada (map 2). At Kalibangan, fire altars have been found atop the citadel as well as in the open space between the citadel and the lower city. In the citadel, there were several mudbrick platforms oriented along the cardinal directions. Atop one of them, a row of seven rectangular fire altars arranged along the north-south line was found. The altars were sunk into the platform and lined with clay. Each of the altars contained a central clay stela (pillar or slab) around which lay ash and charcoal. To the west of these fire altars was embedded the lower half of a jar containing ash and charcoal.

On another platform there was a fire altar and a well besides which stood a 1 m × 1.24 m pit built with baked bricks and containing bovine and antler bones. A terracotta cake found on the site appears to carry the figure of a deity on one side, while the other side shows an animal tied by a rope which in turn is held by a human figure. These platforms were separated from each other by passageways containing baked-brick drains. The platforms were well separated from the fortress walls.

There were no fire altars in the lower city. But 80 m east of it, in the open, there was a structure, whose complete outline could not be recovered. It consisted of an impressive wall enclosing a large room containing "four to five" fire altars, each located separately. There were no signs of normal occupancy on this mound, suggesting that the structure served a purely ritual purpose.[26]

The fire altar at Lothal was of a different type. Located in the lower town, it measured 27.43 cm × 25.88 cm in area and was 30 cm deep. At the northern end of the eastern arm there was a post hole. There was a semicircular depression on the northern arm, and a rectangular one on the southern. An earthen jar, beautifully painted in the Indus style, lay adjoining the eastern arm. The fire altar itself contained ash, triangular terracotta cakes, egg-shaped balls and burnt earth.[27]

No separate dates are available for the fire altars. In the case of Lothal at least, we can associate them with the late Harappan settlement Lothal B which lasted until c. 1600 BC.[28] Kalibangan, however, was an urban settlement without a subsequent late phase. The urban settlement is believed to have come to an end in c. 1800 BC,[29] although the site has provided two radiocarbon dates later than this: 1516 BC and 1345 BC.[30] The cult of fire is considered to be a signature of the Indo-Iranians (p. 194). These fire altars must therefore be taken as indicating the presence of the (non-Ṛgvedic) Indic speakers. The difference between the Lothal and Kalibangan fire altars can be understood in terms of our attributing co-authorship of Cemetery H and Rangpur phases to two culturally differentiated Indic-speaking groups.

An uncomplicated proof of the Indic presence comes from Surkotada, some 160 km northeast of Bhuj in Kutch. Here the presence of the horse is indicated by the discovery of horse bones, not in the earliest layers but in the following sub-period Ib, in which "the Indus elements become less pronounced with the appearance of a new ceramic tradition".[31] A radiocarbon date of 2155 BC is available for this sub-period.[32] Horse bones have since been found at a few other sites also, but it is significant that the horse appears in the Indian mainland towards the end of, or after, the mature Harappan phase.

To sum up, we have argued that the Indo-Iranian speakers appeared on the central Asian scene in c. 2000 BC. This was the time when the urban phase of the Harappan tradition was coming to an end. The Indic speakers first appeared on the northwestern doorstep of the Indian subcontinent during c. 2000–1700 BC. They were not the Ṛgvedic people. They independently combined with the post-urban Harappans to set up late Harappan cultures: Cemetery H culture in Punjab, Jhukar in Sind, and Rangpur in Gujarat.

In the period c. 1700–1400 BC, the Ṛgvedic people were stationed in the Helmand area in south Afghanistan, where they composed the bulk of the Ṛgvedic hymns. In about 1400 BC they arrived on the western tributaries of the Indus. Crossing the Punjab rivers, they arrived in the upper Ghaggar region where they merged with the Cemetery H people to produce the Painted Grey Ware culture (figure 6). It is these people who, armed with iron technology, moved east of the Yaga doab after c. 900 BC.

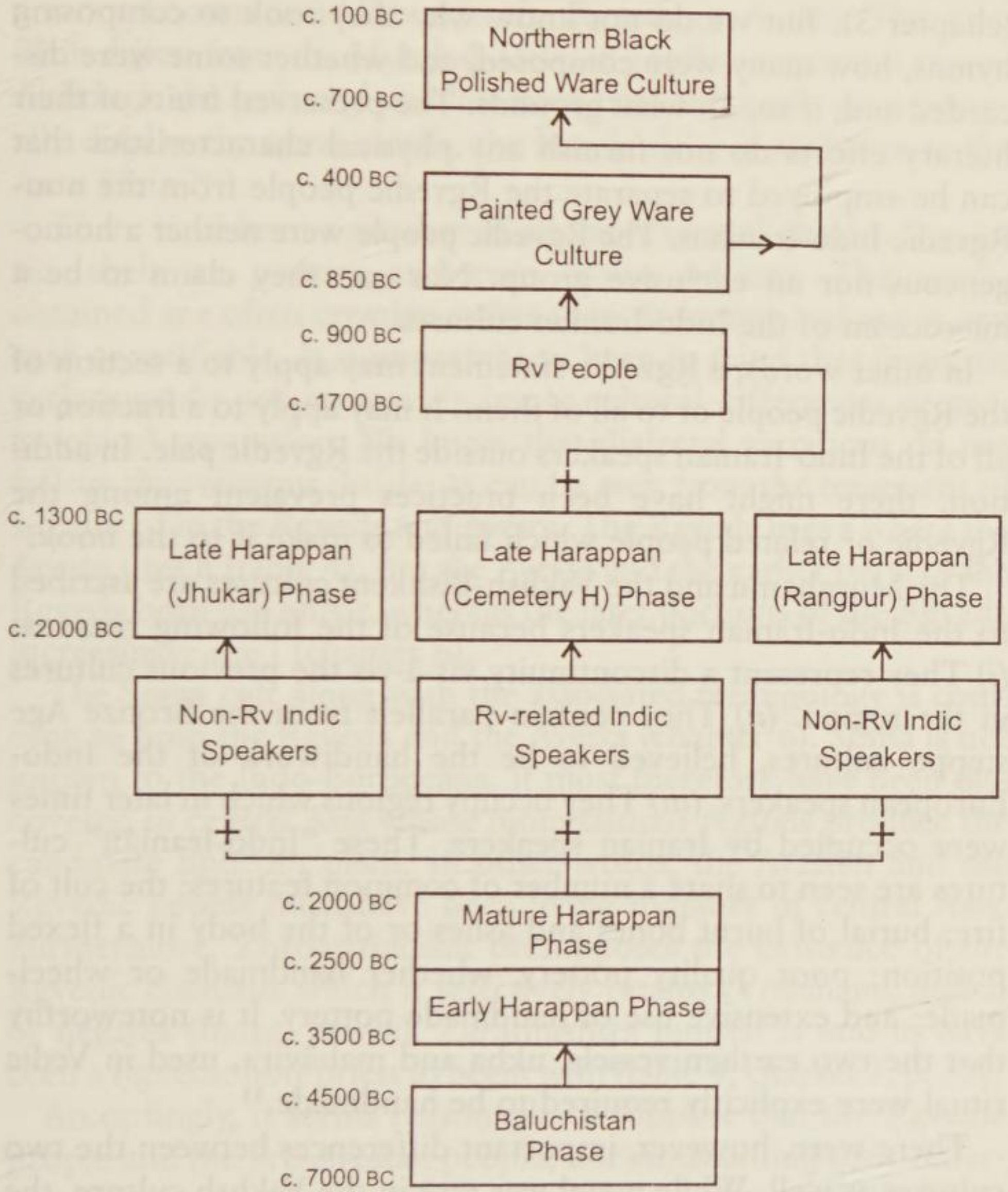

FIG. 6. The evolutionary history of the Harappan and post-Harappan cultures. The non-Ṛgvedic speakers were Indic speakers not connected with the Ṛgvedic people, whereas the Ṛgveda-related speakers though culturally related to the Ṛgvedic composers were not involved in the composition. The later Ṛgvedic people are believed to be the authors of the Swat V culture.

LOOKING FOR THE ṚGVEDIC SITES

The Indo-Iranians were a large body of people with a considerable spread in their material culture, beliefs and dialects. At some stage, a subset of these people decided to compose hymns and

preserve them. We know these people as the Ṛgvedic people (chapter 3). But we do not know why they took to composing hymns, how many were composed, and whether some were discarded and, if so, on what grounds. The preserved fruits of their literary efforts do not furnish any physical characteristics that can be employed to separate the Ṛgvedic people from the non-Ṛgvedic Indo-Iranians. The Ṛgvedic people were neither a homogeneous nor an exclusive group. Nor can they claim to be a microcosm of the Indo-Iranian cultures.

In other words, a Ṛgvedic statement may apply to a section of the Ṛgvedic people or to all of them. It may apply to a fraction or all of the Indo-Iranian speakers outside the Ṛgvedic pale. In addition, there might have been practices prevalent among the Ṛgvedic or related people which failed to make it to the book.

The Murghamu and the Vakhsh-Bishkent cultures are ascribed to the Indo-Iranian speakers because of the following reasons: *(i)* They represent a discontinuity vis-à-vis the previous cultures in the region. *(ii)* They contain parallels from the Bronze Age steppe cultures, believed to be the handiwork of the Indo-European speakers. *(iii)* They occupy regions which in later times were occupied by Iranian speakers. These "Indo-Iranian" cultures are seen to share a number of common features: the cult of fire; burial of burnt bones and ashes or of the body in a flexed position; poor quality pottery, whether handmade or wheel-made; and extensive use of handmade pottery. It is noteworthy that the two earthen vessels, ukha and mahāvira, used in Vedic ritual were explicitly required to be handmade.[33]

There were, however, important differences between the two cultures as well. While metal was rare in the Vakhsh culture, the Murghamu culture displayed metallurgical skills of a very high order. But the Murghamu culture was by no means uniform. Both the Murghab Delta and Amu Plain had rectangular public buildings. But the Amu Plain had, in addition, circular buildings which were absent in the Murghab Delta. These buildings seem to correspond to the forts described in the Ṛgveda as belonging to the enemies. These enemies did not press Soma, identified with alkaloidal Ephedra (p. 98). Interestingly, traces of Ephedra are reported from sites in the Murghab Delta. Any correspondence with the textual drink, however, is not clear-cut, because in

Murghab, Ephedra is associated with poppy and cannabis which are not known as additives in the Ṛgveda or Avesta. The Amu Plain differs from the Murghab Delta in another important aspect. Although the seals and amulets from both these sub-areas generally display the same motifs, the female deity is exclusive to the Amu Plain.[34]

There have been a number of attempts to stick precise linguistic labels on pottery and even entire cultures. The results obtained are often creative rather than deductive and are in any case unverifiable. It is important to keep in mind that linguistic variations do not necessarily imply cultural differences or geographical separation. We know that dialectal variations do not follow the religious divide, as can be seen from the treatment of s-h and r-l in the Ṛgveda and Avesta. The Ṛgveda uses s where the Avesta uses h (table 4). But the Avesta and the earlier parts of the Ṛgveda both use only r, whereas the later portions of the Ṛgveda increasingly use l (chapter 6).

The Soma cult along with the associated terminology is common to both the Ṛgveda and the Avesta (chapter 6). Soma is not known to the Indo-Europeans. It must therefore have been discovered in central Asia whose mountainous regions produce the candidate Ephedra plant. In other words, the Avestan and the Ṛgvedic people must have been living together in central Asia. Furthermore, Zoroastrianism presupposes the existence of the Ṛgvedic elements which it selectively retains (Vṛtrahana, Soma) or negates (Indra, Devas). Zarathushtra himself is said to have been a Ṛgvedic hotṛ priest to begin with (table 4; chapter 3, p. 32).

Accordingly, it seems reasonable to suppose that the Ṛgvedic people and the pre-Avestan people, notwithstanding their different dialects, were living together in a common geographical area where the Avestan religion arose as a reaction to the Ṛgvedic philosophy and practices which were already in vogue. It seems likely that the extant Ṛgvedic hymns provided a role model for Zarathushtra in his composition of the Gathas. The common area (comprising, in Ṛgvedic nomenclature, Sarayu, Sarasvatī and Sapta Sindhavaḥ) has already been identified with south Afghanistan (chapter 7, table 9). This area would have come under the Avestan influence after the Ṛgvedic people migrated (c. 1400 BC) eastwards into India and westwards into west Asia. This roughly then must also be the date associated with Zarathushtra.

There are two Sanskrit words pertaining to the area north of the Hindu Kush which do not figure in the Ṛgveda. One is the river name Vakṣu. The other is Rājavarta, a semi-precious stone (whose Iranian cognate Lajvart gave rise to the English term lapis lazuli) mined in north Afghanistan since ancient times. This suggests that there were Indo-Iranian speakers north of Afghanistan, who, though not connected with the Ṛgvedic composition, later joined the post-Ṛgvedic mainstream.

It appears likely that in the course of time, the Avestan religion brought into its fold other Indo-Iranian speakers, who had been outside the Ṛgvedic zone of influence. These people must have been living in the real lands said to be created by Ahura Mazda (table 9).

On the face of it, the Swat culture fits the Ṛgvedic bill partially. It has rivers that figure in the Ṛgveda and graves that match the Ṛgvedic description. There is however more to the Ṛgveda than Swat. There are, for example, the hymns composed on the banks of Sarasvatī.

Conventional wisdom identifies Ṛgvedic Sarasvatī with the old Ghaggar. We have already given a number of reasons against this identification (chapter 7). There are additional reasons as well. The Indo-Aryans, starting from the Eurasian steppes, would arrive on the Indus before they would reach the Ghaggar. Therefore, if Ghaggar were Sarasvatī, one would expect the Indus hymns to be older than the Sarasvatī hymns. As already noted, Sarasvatī hymns are as old as, or older than, the Indus hymns. Furthermore, archaeologically there is nothing in the Ghaggar Plain that can even remotely be connected with the Ṛgveda. There are no Swat or Bishkent-type burials on the Ghaggar. All available evidence in fact suggests that the Aryan presence on the Ghaggar came later and in a form different from the "pure" Ṛgvedic, because of the intervening Harappan cultural area.

It makes more sense to place Ṛgvedic Sarasvatī to the west of the Indus, so that the west-to-east movement coincides with time progression. We have already identified Ṛgvedic Sarasvatī with the Helmand (chapter 7). Unfortunately, this area has so far remained unexcavated. We believe that if the Helmand-Arghandab doab is excavated, it would reveal signatures of the Ṛgvedic times. We would expect to see cultures resembling the Bishkent

and the Swat, hopefully with traces of Ephedra. One specific literary reference can be archaeologically tested. Lāṭyāyana Śrautasūtra (10.19.8–9), as we already know, tells us that as one proceeds along the southern bank of Dṛṣadvatī (here identified with the Arghandab), on reaching a ruined village, one can descend into Yamunā (here identified with a tributary of the Helmand). Therefore, we would expect to find ruins of Ṛgvedic times along the Arghandab, especially on its upper course which is near a minor tributary (Yamunā) of the Helmand (Sarasvatī). Also, in the hilly areas, there should be remains of the non-Ṛgvedic pockets of people, called Pārāvatas in the Ṛgveda.

The basin of the Hari-rud (here identified with Ṛgvedic Sarayu), and the region of the Seistan rivers like the Farah-rud (Sapta Sindhavaḥ) also need to be archaeologically excavated. Since the Sarayu people were not explicitly associated with the composition of the Ṛgvedic hymns, a comparison of the proposed Hari-rud and Helmand-Arghandab cultures would reveal whether there were any material differences between the hymn composers and others.

It seems likely that the Ṛgvedic people in their pre-Ṛgvedic phase were stationed in Bishkent. From here they could conveniently have raided Dashli 3-type circular forts (map 12). When they migrated to the upper Helmand, they carried memories of these raids and incorporated them into their hymns. It is noteworthy that in the Ṛgveda, the defeat of Dāsas like Śambara, Varcin, Dhuni, Cumuri, Pipru, and others occurs not at the hands of named Aryan chieftains but Indra himself. This suggests that at the time of the composition of the Ṛgveda, these victories were already ancient and part of folklore. The Ṛgveda also describes contemporaneous battles fought by chieftains like Divodāsa and Sudās against the Pārāvatas and others. These must be treated as actual battles[35] (chapter 5).

The chronological problem remains to be addressed. The Vakhsh-Bishkent cultures (c. 1800–1400 BC) arose when the Murghamu culture (c. 2100–1700 BC) was on its last legs. The Helmand-Arghandab culture is not expected to be older than c. 1700 BC, making it more or less contemporaneous with the Swat culture. To explain the lateness of the Indus hymns, we must postulate a two-stage development of the Swat culture. The

Swat IV culture was probably founded by non-Ṛgvedic Indo-Iranians who, to be more specific, were speakers of Kafiri languages which have survived in the region to this day. At the end of period IV, the actual Ṛgvedic people migrated from the Helmand to the Indus where they composed most of the remaining hymns before moving further eastwards.

RGVEDIC PEOPLE AND THE HARAPPANS

It is clear from the discussion so far that the Harappans and the Ṛgvedic people were two separate people. For ready reference, we list below the various arguments on which this conclusion is based.

The strongest arguments come from natural history:

i. The Ṛgvedic people were familiar with the horse which was domesticated during the proto-Indo-European phase itself. The domestication of the horse presupposes the existence of the wild horse. The natural design of the horse is such as to enable it to roam and run on the hard soil of plains, eat coarse grasses, and escape from enemies by a burst of speed. From the point of view of prehistory, the important period is the one that began 10,000 years ago with the termination of the last Ice Age. During this period and until relatively recent times, the truly wild horse *(Equus caballus)* has been extant in Europe and central Asia.

We can distinguish three types of wild horses. The first type is known as Przewalski's horse after the Russian colonel who discovered a wild horse in Mongolia in 1881. This sand-brown horse used to live in western Mongolia and eastern Kazakhstan. The second type was the mouse-coloured European tarpan, which lived in huge areas of eastern Europe and the Ukrainian steppes. It is this horse that is believed to have been domesticated by the proto-Indo-Europeans. The third type of wild horse was a massive, slow moving horse which lived in the wet pasturelands of northern Europe. No pure wild horses seem to exist now.[36]

It is noteworthy that the Indian subcontinent is not the natural habitat of the horse. There never have been wild horses in the subcontinent. No horse bones have been found in the earliest occupancy layers at Mehrgarh, even when wild animals were an

important food item. If the horse came to India from outside, so must have its tamers and riders. The horse appears in India only towards the very end of the mature Harappan phase or in the late Harappan phase, at sites like Surkotada in Kutch. It can thus be asserted with confidence that the cultural continuum from Mehrgarh to the closure of the urban Harappan phase, extending from c. 7000 BC to c. 2000 BC, owed its existence to people not familiar with the horse, and that the horse and its riders first entered the scene in c. 2000 BC to co-found the late Harappan cultures.

ii. The Aryans were avid Soma drinkers and could pluck the Soma plant by the wayside (Ṛv 8.80.1). The Soma plant has been identified with alkaloidal Ephedra which grows only in mountainous regions (chapter 6). It does not grow in the plains. The entire Harappan expanse is without the drink-yielding Ephedra. The fact that the Brāhmaṇa literature talks of substitutes for the unavailable Ṛgvedic Soma plant shows that the theatre of the Brāhmaṇas was different from that of the Ṛgveda. Had the Ṛgveda been composed in the Harappan expanse, there would not have been any need for its replacement in the subsequent period.

The horse and Soma together firmly rule out the possibility of the Indian plains being the seat of the Ṛgvedic composition.

Additional arguments come from geographical considerations:

iii. There are no mountains in the Harappan territory. The Harappan culture's closest contact with mountains is through a couple of outposts in the Shivalik foothills (near Ropar and Jammu). In contrast, Ṛgveda (10.121.4) mentions the snowy Himavant mountains and the rivers originating from them. The mountainous connection of the Ṛgvedic people is reinforced by the reference to the Uttarakurus and Uttaramadras living on the other side of the mountains.

iv. The Ṛgveda mentions the western and northwestern tributaries of the Indus, like the Kabul, Swat and Gomal. There are however no mature Harappan sites on them.

v. Vedāṅga Jyotiṣa (verses 7 and 22 of the Ṛv-version) says that the duration of the longest day to the shortest night is in the ratio 3:2. This statement implies an astronomical observation made at a latitude of 35° N (chapter 6). No Harappan site has been discovered at such a high latitude, except for Shortugai which was a trading post outside the Harappan mainstream.

vi. The Ṛgveda mentions Gaṅgā, Gomatī and Sarayu. If the Ṛgvedic and Harappan people were identical, there should have been Harappan settlements on these (present-day) rivers. This, however, is not the case. The Harappan tradition, in fact, stops short of the Ganga.

vii. If the Harappan tradition is to be attributed to the Ṛgvedic people, the old Ghaggar must be identified with Ṛgvedic Sarasvatī. But contrary to the general belief, the Ghaggar does not match Ṛgvedic Sarasvatī's attributes (chapter 7). In the Ṛgveda, Sarasvatī is a mighty river that cuts mountain ridges. The Ghaggar in contrast is a rainwater stream in the lowly Shivaliks. This attribute of the upper Ghaggar would not change even if the Ghaggar were to later receive the waters of the Satluj and Yamuna. The Ṛgveda explicitly associates the Satluj with the Beas. As for the Yamuna, the geologists believe that it has been flowing in its present channel for at least the last 20,000 years, implying that the Ghaggar has been left largely to its own devices ever since.

viii. The later Vedic literature associates both Gaṅgā and Yamunā with Sarasvatī, in a subsidiary capacity. Both these snow-fed rivers would be mightier than even the old Ghaggar. Furthermore, in no case can the Ganga be associated with the Ghaggar, leave aside in a secondary capacity.

ix. The Harappan tradition extends to Kutch and Saurashtra, but these areas are not known to the Ṛgveda. In contrast, while the Harappans seem to have studiously avoided the Punjab rivers, the Ṛgveda not only names them but also refers to their might and floods.

The identification of the Ṛgvedic people with the Harappans is also ruled out by the mismatch between the available archaeological evidence and the Vedic description:

x. Archaeologically, the oldest sites are in Baluchistan, followed by the lower Indus, lower Ghaggar and upper Ghaggar in that order. This relative chronology is not seen in the Ṛgveda where the upper Sarasvatī hymns are among the oldest.

xi. The Ṛgvedic villages are associated with forests, while the Harappan sites lie in arid areas.

xii. The Baluchistan-Harappan tradition was characterized by conservatism and inertia. Once a village or a town was established, it remained occupied for hundreds and thousands of years

(for instance, Mehrgarh, Harappa, Kalibangan and others). In contrast, the picture that emerges from the Vedic texts is of a people on the move.

The Sanskrit word grāma or village has a number of meanings according to Pātañjali's Vyākaraṇa Mahābhāśya (1.1.7.8). It denotes *(a)* a group of dwelling units, as in "the grāma is burnt"; *(b)* an enclosure, as in "he has entered the grāma"; *(c)* the inhabitants, as in "the grāma has come; the grāma has gone"; and finally, *(d)* the above three along with the adjoining fields and forest, as in "a grāma has been obtained".

These meanings have been current in classical Sanskrit from at least the second century BC. There is however no doubt that the oldest meaning is the one listed at *(c)*, that is, in the sense of a mobile unit consisting of people along with their cattle, ox wagons, horses and chariots. The term grāma also denoted the temporary camp of this unit.[37] Ṛv (3.33.9), announcing the arrival of ṛṣi Viśvāmitra at the confluence of Beas and Satluj, talks of "the bard who cometh to you from far away with car and wagon".

Connected with the concept of a mobile grāma was that of an armāḥ, the remnants of a grāma that had been abandoned. We read in Taittirīya Brāhmaṇa (2.4.6.8): "The people to whom these armāḥ formerly belonged—homesteads lacking sacrificial stakes, widely distributed and numerous—they have, urged by you [O Agni Vaiśvānara], advanced to another country". However, the abandoned villages were not discarded for good. The Vedic people returned to their vicinity with their cattle. The armāḥ were given names and used as landmarks: "He [i.e., Namin Sāpya, king of Videha] descended for the lustral bath into that lake which is situated to the north of Sthūlārma; there his hundred cows had become a thousand" (Pañcaviṃśa Brāhmaṇa 25.10.18). "There are armāḥ named Naithandavāḥ on the Sarasvatī. One of them is Vyarṇa" (Lāṭyāyana Śrautasūtra 10.18.13).

The armāḥ were bestowed with some sanctity and put to use. Potsherds from armāḥ were pounded and mixed with clay for making pottery and figurines (Taittirīya Saṃhitā 3.1.6.2). The potsherds were even used as talisman; they were tied to a sick person.[38]

It is thus clear that the Vedic people led a nomadic life, setting up villages and abandoning them only to return to the area

again.[39] This is in marked contrast to the sedentary lifestyle of the Harappans.

xiii. The Ṛgvedic description of the enemy forts seems to match the archaeological remains at Dashli 3 in the plain of the Amu Darya. We have suggested that the Ṛgvedic people encountered these enemies while they were stationed north of the Hindu Kush, say at Bishkent. It is unlikely that the food-surplus, apparently peace-loving mainstream Harappans of the Greater Indus Valley would have either felt the necessity or had the capability to raid settlements lying beyond the Hindu Kush.

xiv. During its mature period, the Harappan civilization must have been headed by a central authority which ensured the culture's well-attested uniformity. This urban-phase centralization was preceded and succeeded by various autonomous regional entities. In contrast, the Ṛgvedic kings were constantly at war with each other. There is no indication whatever of the existence of a central authority in the Ṛgveda.

xv. Excellent town planning, public architecture, standardized weights and measures, and distinctive seals and script were the hallmarks of the mature Harappan phase. None of these finds mention in the Ṛgveda.

The well-established linkage between the Avesta and the Ṛgveda argues against the Indian origin of the Aryans:

xvi. The Avesta knows of Sindhu as a generic name for a river but does not know of River Indus, which it recognizes as a semi-mythical river, Veh. Surely, if the Avestan people had migrated from India they would have known about the Indus.

xvii. The Avesta itself or its commentaries do not mention any territories in India. In contrast, there are clear references to territories in central Asia and Afghanistan.

xviii. The commonality of the cult of Soma/Haoma between the Ṛgvedic and the Avestan people implies a common source of Ephedra, which can only be the Hindu Kush. If the Harappans were the Ṛgvedic people, we must look for a plant in the Harappan expanse that also occurs in the Swat area and the Avestan lands and, in addition, matches the description in the Ṛgveda and the Avesta. There is no such plant (see ii).

xix. There are two major language groups in India: Dravidian and Sanskrit. There are also two archaeological cultures. One is

the Harappan, while the other in its unmodified form is represented by Swat and Pirak in northwest India. The most logical way to understand this double duality is to correlate the Harappan culture with the Dravidian speakers and the Swat-Pirak cultures with the Indic speakers. This correlation is supported by the fact that though northwest India is the home of the Indo-Iranian languages, it still hosts a pocket of speakers of a Dravidian-related language, Brahui. The Brahui speakers (estimated to be about 350,000 in 1960) are confined to Baluchistan, with the Kalat region alone accounting for about 40 per cent of them. The majority of the people in the area speak Baluchi, an Indo-Iranian, or more specifically, an Iranian language (p. 36). It is surmised that the Brahui speakers are related to the urban Harappans.[40]

Although no counterparts of Brahui speakers exist in south Turkmenistan, we have a similar situation here as well. The urban Namazga V culture was superseded by new cultural elements. Since the entire region, extending from the Euphrates and Tigris in the west to the Indus in the east, took to agriculture more or less simultaneously, it is very likely that the pioneering farmers, including Mehrgarhians, came from the same stock.

The same region may also contain clues to the origin of the yet undeciphered Harappan script. Southeast Iran was part of the extensive ancient kingdom of Elam, whose language Elamite (c. 2300 BC) has been deciphered as non-Indo-European. A number of Elamite sites, including Tepe Yahya and Shahr-e Sokhta, have yeilded steatite tablets (dated c. 3400 BC) which carry inscriptions designated as proto-Elamite. As already seen (p. 162), Tepe Yahya lay on the ancient overland route which linked Harappa and Mesopotamia. It has been suggested that the Harappan script is related to the proto-Elamite one.[41]

This elegant, self-consistent regional pattern—of an urban culture being superseded or modified by new arrivals—is unnecessarily destroyed by the arbitrary identification of the Harappans with the Indo-Aryans. A number of settled questions suddenly go begging for answers. What is the origin of the Dravidian languages? Who were the new people in Swat and Pirak? Who superseded the Namazga V culture? Who were the people who founded the Murghamu culture? What is to be made of the new cultural elements of steppe affiliation which appeared in central Asia after 2000 BC?

The circumstance that the Indo-Iranians are a subset of the Indo-Europeans further weakens the case for a Harappan or Indian origin of the Ṛgvedic people:

xx. The Baluchistan-Harappan archaeological tradition represents an unbroken cultural continuum that extended from c. 7000 to c. 2000 BC (chapter 5). Any entry into this cultural setting could have taken place either after 2000 BC or in or before 7000 BC. The presence of Indic speakers in India in c. 7000 BC presents problems not only for Indo-Iranianism but also for Indo-Europeanism. We know from the commonality of vocabulary that before their dispersal, the Indo-Europeans were already familiar with the domesticated horse, wheeled vehicles and metal. No horse bones have been found anywhere in Baluchistan, and the appearance of the wheel and metal took place a few millennia after the founding of Mehrgarh. Also, there is no archaeological counterpart of Mehrgarh in Iran-Afghanistan which can even in theory be assigned to the Avestan people. One can therefore rule out the presence of the Ṛgvedic people in the Indian subcontinent in neolithic times.

xxi. It has been proposed[42] that the proto-Indo-Europeans were neolithic farmers in east Turkey (ancient Anatolia), who started spreading out in c. 6000 BC. The hypothesis has justifiably been criticized[43] for its failure to explain certain well-established features of Indo-Europeanism: east Turkey is not the natural habitat of the horse; the wheel was absent in neolithic times; the non-Indo-European languages in the region (Hatti) do not fit into the pattern suggested; and the proposed population movements do not correspond to the established similarities within the Indo-European family of languages.

Many arguments against east Turkey being the home of proto-Indo-Europeans also apply to the hypothesis that seeks to make India the home of the Ṛgvedic people:

xxii. There are a number of Indo-Iranian and Indo-European loanwords in the Finno-Ugric family of languages. Since the Finno-Ugric speakers did not move away from their north European homeland, the proto-Indo-Iranians must have been located near by.

xxiii. If the Indian subcontinent were the Indo-European homeland, it should have been the centre of the migration of the Indo-

European speakers. In reality it lies at one end, there being no Indo-European languages to the east of India and in south India. This implies that the centre was somewhere to the west.

xxiv. If the Indian subcontinent were the Indo-European homeland, the Ṛgvedic language would be the mother of the Indo-European languages. Lingustic evidence indicates that it is one of the sister languages, not the mother language. Words in other Indo-European languages are not derived from the Ṛgvedic language but from a common, no-longer-extant source, from which Sanskrit words have also originated. For example, Latin equus and Sanskrit aśva both come from the proto-Indo-European reconstruction *ekwos, where * signifies that the word is hypothetical.

xxv. Soma is known only to the Indo-Iranians. If the Indo-Europeans had emanated from India, Soma would have also figured in the other languages of the Indo-European family.

xxvi. Most features of the Indo-European language and mythology can be satisfactorily explained by postulating a homeland in the European steppes (chapter 8). Any alternative hypothesis, to be acceptable, must explain the linguistic and mythological commonalities at least to the same degree of satisfaction.

xxvii. In recent times, it has become possible to study patterns of human migration by using a new scientific tool, genetic fingerprinting. Consider two population samples which to begin with are genetically identical. With the passage of time, the two samples will increasingly differ from each other because of natural selection and random genetic drift. We can therefore associate a unique genetic profile with a population sample. When this population migrates, it spreads its genes. By carefully selecting certain genetic molecules as markers and by examining living human beings over a vast geographical area, we can reconstruct the routes of large-scale migrations in the past. Studies of genetic differences have shown that in about 3000 BC, migrations took place into Europe from the nuclear region of the Don River. This corresponds to the migration of the European branch of Indo-Europeans from the Eurasian steppes, which, then, must also be the starting point for the Indo-Iranians.[44]

We have thus argued that the Ṛgvedic people and the Harappans are unconnected.[45] It remains to comment on the real or

perceived parallels between the Vedic texts and the Harappan culture.

The composition of the Ṛgvedic hymns was taken up after c. 2000 BC by some of the Indo-Iranian speakers who came to central Asia and Afghanistan from the north. By this time, the mature phase of the Harappan tradition was already over. The post-urban Harappans came in contact with the Indic speakers during the late Harappan phase. These Indic speakers, however, were not the Ṛgvedic composers. The Ṛgvedic people, in turn, came in contact with the late Harappans in c. 1300 BC in north India, where their synthesis is underlined by the PGW culture. The Ṛgveda was finally closed in c. 900 BC, at the beginning of the Iron Age.

The above theory has the following consequences: The mature Harappan phase is independent of the Ṛgveda. Features like the fire altars at Kalibangan and Lothal and the horse at Surkotada appear in the late Harappan phase thanks to the arrival of the Indic-speaking elements.

The older parts of the Ṛgveda are independent of any Harappan influence. This, however, may not be true of the younger parts. It is conceivable that on the merger of the Ṛgvedic people with the late Harappans (who were already an admixture of post-urban Harappans and Indic speakers), some of the latter were admitted as members of the hymn composers' club. In that case, some Harappan elements could find reflection in the late Ṛgvedic hymns. Even if we assume that the composition of the hymns remained the exclusive domain of the old elite, the language of the later hymns can be expected to be modified owing to the integration of this elite and the "native" (presumably Dravidian-speaking) population.

There are a handful of Dravidian words in the Ṛgveda: for example, ulukhala, "mortar" (Ṛv 1.28.6), khala, "threshing floor" (Ṛv 10.48.7). The small number of such words implies limited contact with the Dravidians in the Ṛgvedic times. Significantly, ulukhala was used for preparing the Soma drink (chapter 6), suggesting that the contact was made in the Soma habitat. The Dravidian influence increased with time, as can be seen from the presence of retroflexion in the Ṛgveda. Unlike the Avestan but like the Dravidian languages, the Ṛgveda contains sounds like ṭ,

ṭh, ḍ, ḍh, ṇ, ṣ. It has been convincingly argued that retroflexion was not part of the original composition, but was (unconsciously) added at the level of reciters, editors and redactors (like Māṇḍūkya and Śākalya, presumably) because of their Dravidian or Munda background.[46]

There can be no doubt that the later Vedic texts represent the new post-Ṛgvedic, composite culture. Concepts like Paśupati and Mother Goddess are obviously Harappan constructs that were incorporated into the Aryan fold. The merger of the nomadic Ṛgvedic people with the inheritors of the urban tradition, coupled with the passage of time, might explain why the rawness visible in the Ṛgveda[47] disappeared altogether on the Indian soil. If the Harappan seals show motifs that sound familiar from the Vedic texts, it does not prove that the seals were made by the Vedic people. Rather, it might simply mean that the seals are older than the texts and that the descendents of the seal-makers were associated with the composition of the later Vedic texts.

To sum up, we have seen that the picture of the Ṛgvedic setting that emerges from considerations of natural history, geography and material culture does not correspond at all to the Harappan tradition or territory. One may say in a lighter vein that if a television serial were made on the Ṛgveda, it would not be possible to shoot it in Mohenjodaro, Harappa, Kalibangan, Lothal or Dholavira. Any similarities between the later Vedic texts and the Harappan culture pertain to the post-urban Harappan phase when the Indic speakers had not only come into contact but also merged with the Harappans.

10

RĀMĀYAṆA AND MAHĀBHĀRATA

Should you ask me, whence these stories
Whence these legends and traditions?

—Henry Wadsworth Longfellow, introduction,
The Song of Haiwatha

Two ancient stories have come down to us in the epics Rāmāyaṇa (involving Rāma) and Mahābhārata (involving Kṛṣṇa). Since the Purāṇas regard Rāma and Kṛṣṇa as real persons, it is reasonable to suppose that the kernel of the epics is a genuine historical event, even though the stories have been embellished extensively and often. We have already placed, on the basis of Purāṇic evidence, Rāma at about 1450 BC and Kṛṣṇa at about 900 BC (chapter 4, pp. 56–7; figure 1). Both these dates fall within the Ṛgvedic period. Therefore, the examination of the setting of the two epics is equivalent to looking at the Ṛgvedic period from a different, less rigorous, and popular perspective.

RĀMĀYAṆA

The Rāmāyaṇa story deals with the life and travails of Prince Rāma of Ayodhyā who finally defeated and killed King Rāvaṇa of Laṅkā. An attempt has been made, as already noted (chapter 5), to test the story on the touchstone of archaeology. According to the Rāmāyaṇa, when Rāma, Sītā and Lakṣmaṇa left Ayodhyā on exile, they stopped at Sṛṅgaverapura where the Niṣāda chief escorted them across the river Gaṅgā. They then visited the Bharadvāja Āśrama on way to Citrakūta where they spent some time. These four sites have been excavated, with rather unexpected results. The settlement at Sringaverapura[1] has turned out

to be older than at Ayodhya, believed to be the ancient capital of the Ikṣvākus. As already noted (chapter 5), the oldest common factor at these four sites is the NBP ware. The commonality at these sites, which is expected if they were connected with the same historical event, cannot go beyond the seventh century BC. This date is much later than any of the dates assigned to the story.

It is thus clear that these places have been named in honour of the Rāmāyaṇa. (An Ayodhya was founded as recently as c. AD 1350 by King Ramadhipati, in Thailand). They are not the actual sites connected with the Rāmāyaṇa story. Rāma's Ayodhyā belonging to the Copper Age must therefore have been somewhere else. It could not have been anywhere in the Ganga Plain because all the settlement sites here, like the present-day Ayodhya, are of relatively recent origin. In the absence of any authentic information about this ancient Ayodhyā, the only reliable clue available is the fact that it was situated on the banks of river Sarayu. The problem then reduces to locating the old Sarayu, which we must seek to the west of the Yamuna.

The Punjab rivers as well as the western tributaries of the Indus are named in the Ṛgveda (chapter 7). This leaves only the Ghaggar river system to be examined. We have argued that it was already defunct in Vedic times (chapter 7). Most scholars have however assumed that the Ghaggar was still flourishing and should be identified with the Ṛgvedic Sarasvatī. In any case, all rivers between the Yamuna and the Indus are accounted for. River Sarayu must then lie still further west. Indeed, as we have already argued (chapter 7), Ṛgvedic Sarayu should be identified with the Avestan Sarayu (Haroyu) whose present name is Harirud. Rāma's Ayodhyā must then be placed on its banks and Rāma himself must have lived in Afghanistan. The conclusion appears to be rather drastic, but is inescapable if we try to reconcile Purāṇic history with archaeological evidence. Even though the characters in Rāmāyaṇa are from older times, the story itself is post-Bhārata battle in character. It is therefore unlikely that the text would provide any explicit references to the Afghanistan setting.

Rāma's clan, however, certainly had a northwestern connection.[2] An early Ikṣvāku king Māndhātṛ conquered the Druhyu king, Aṅgāra. Aṅgāra's near descendant was Gāndhāra who gave

his name to the Gāndhāra country, believed to be the Kabul area. The name survives in Kandahar, further west (chapter 9). Since the Druhyus have consistently been placed in the northwest, the Ikṣvākus must also have been located near by. The Kekayas are said to have occupied the territory between Sindhu and Vitastā (Jhelum). Marriages in those days would have taken place among tribes located near each other. Ayodhyā, therefore, could not have been far away.

Furthermore, Bharata's two sons, Takṣa and Puṣkara, are said to have founded Takṣaśilā (modern Taxila), to the east of the Indus, and the nearby Puṣkaravatī (known to the Greeks as Peukelaotis, now as Charsada), to the west of the river. Contrary to the earlier belief that the Charsada site was occupied no earlier than the sixth century BC, recent work has shown that the earliest levels of occupancy at Charsada go back to the end of the second millennium BC, with the distinct possibility that still earlier levels might have gone unnoticed.[3] Charsada lies in the Swat region, which provides archaeological evidence believed to be from the Ṛgvedic period (chapter 9). The two sons of Lakṣmaṇa, Aṅgada and Candraketu, are assigned territories near the Himalayas, in Kārapathadeśa, which according to the Padma Purāṇa was in Madra, i.e., Punjab. Interestingly, there is a legend in Punjab that the towns of Lahore and Kasur were founded by Rāma's sons Lava and Kuśa.

According to the Rāmāyaṇa, at a sacrifice in Ayodhyā, kings from Kekaya, Sindhu and Sauvīra participated, but the Yādavas and Pāñcālas were not invited. This was so, even though they headed powerful kingdoms in the region between Punjab and Ayodhya. If Daśaratha had been located in the present Ayodhya area, he would have been expected to invite his immediate neighbours, the Pāñcālas and the Yādavas. That this was not the case lends further weight to the earlier suggestion that in Daśaratha's time, the geographical setting was different from the one that came about in the historical era. Interestingly, this was the time when the Ṛgvedic hymns were being composed under the auspices of the Pāñcālas. Similarly, while the Rāmāyaṇa describes Prayāga as being in a great forest opposite the Niṣāda capital Sṛṅgaverapura, according to the Purāṇic picture the territory was part of the Vatsa kingdom.

The description of Bharata's route from Kekaya back to Ayodhyā, as described in the Rāmāyaṇa, is revealing. He crossed the confluence of Gaṅgā and Sarasvatī and entered the Bhāruṇḍa forest (Ayodhyā. 65.5). In the next verse, Yamunā is described as surrounded by mountains ("parvatāvṛta"). These descriptions look incongruous with respect to the present river names but make good sense if Sarasvatī is identified with the Helmand, and Gaṅgā and Yamunā as its tributaries in the hilly areas (chapter 7).

Geography enters the Rāmāyaṇa in a big way when Kiṣkindhā-kāṇḍa describes the efforts made to locate Sītā after her abduction. Sugrīva sent four Vānara parties in four directions, giving them detailed instructions including names of rivers, countries, mountains, seas, and so on (Rāmāyaṇa Kiṣkindhā. 39–42). Interestingly, most of these names are also found in the Matsya Purāṇa (163.60–89) where they figure in a different context. These stanzas describe how Hiraṇyakaśipu terrorized different rivers, mountains, seas, and so on. Several of these stanzas have been incorporated verbatim into the Rāmāyaṇa. There is one important difference, though. While the Matsya Purāṇa gives the names in a heap, the Rāmāyaṇa purports to arrange them direction-wise. Curiously, rivers Sindhu and Sarasvatī are placed in the east, while there are no rivers that are said to be in the west![4]

Why is the geography as given in the Vālmīki Rāmāyaṇa so confused? It is hard to believe that its author was so ignorant that he did not know that Sindhu lies in the west or that (Indian) Ganga and Sarasvati do not meet. The geography sounds confusing because the author is referring to the original setting of the story which was in Afghanistan. From the vantage point of the Hari-rud (Sarayu), the rivers Indus (Sindhu) and Helmand (Sarasvatī) would be placed east, and if Gaṅgā is taken to be a tributary of the Helmand, then Gaṅgā and Sarasvatī do meet (map 7). The geography of the Rāmāyaṇa is consistent with the geography of the Afghanistan rivers. It sounds confusing in relation to the geography of the present-day Ganga river system.

With Rāma in Afghanistan in about 1400 BC, Rāvaṇa's Lanka can be a small island in the middle of River Indus that could be reached via, say, the Bolan Pass. Near the Arabian Sea, the Indus, flush with waters from its tributaries, is large enough to pass off as a sea. Rāmāyaṇa (Kiṣkindhā. 52.12) places the sea just beyond

the Vindhya mountains. The statement can be true only if by Vindhyas is meant the Baluch Hills, and by sea the lower Indus. It is significant that Rāvaṇa's sister Śūrpanakhā and later Rāvaṇa himself had no difficulty in reaching Rāma's camp.

The temptation to make Rāvaṇa a Harappan king should be resisted. Rāvaṇa hailed from the same region as Rāma, if not the same stock. Rāvaṇa was well versed in the Vedas and had a respectable genealogy that is known to the Purāṇas. Rāvaṇa was the grandson of ṛṣi Pulastya. His father was Viśravas and mother Kekasī (or Keśinī). Kubera was his half-brother. It is likely that at a later stage, Rāvaṇa was made into a Rākṣasa to symbolize hostile aborigines whom the Indo-Aryans encountered. Obviously, the Vānaras represent the friendly non-Aryans. Whether they were Rāma's contemporaries in Afghanistan or were added later to the story is difficult to say.

Although Rāma lived well before the canonization of the Ṛgveda, his story is not known to the Vedic literature—even though kings of the time such as Divodāsa, Sṛñjaya and Sudās figure prominently in the Ṛgveda. This is consistent with the fact that the Ikṣvāku dynasty had no role in the composition of the Ṛgveda. Rāma's later-day importance may be a tribute to his dignified self-abnegation which would have stood in sharp contrast to the debilitating power play of the Bhārata war. One, however, suspects that exile from kingdom would have sounded a much less harsh punishment in the semi-nomadic, Rāmāyaṇa period than it would be perceived in later, post-Mahābhārata, urbanized times.

(The Rāmāyaṇa story has not remained static. It has been like the Picture of Dorian Gray of the Hindus. It has continually evolved to reflect the then prevalent state of Hindu society. The Rāmāyaṇa's theatre was recast to correspond to the geographical area finally occupied by the Indo-Aryans. The rise of Brahminism was recorded by addition of details like Sītā's agniparīkṣā and Rāma's killing an "untouchable" for the crime of studying the Vedas. And finally the public enactment of the Rāmāyaṇa story over several days, every year, in north India [but not in the south] represented an attempt by the Hindus to cope with Muslim dominance.)

RĀMANAVAMI AND VIJAYADAŚAMĪ

There are two festivals associated with Rāma: Rāmanavami and Vijayadaśmī. They fall six months apart and are in fact calendric festivals celebrating the spring and autumn equinoxes. The traditional Indian calendar is based on the astronomical texts, Siddhāntas, and is dated about AD 500. This calendar conceptually stands apart from the internationally used Gregorian calendar as well as from the Hejira calendar.

Nature has provided humankind with two timekeepers, the sun and the moon. The Gregorian calendar uses a tropical year and totally does away with the role of the moon as a month-maker. That is why the months in it vary arbitrarily in length from 28 to 31 days. In the Gregorian calendar, the spring equinox falls on or about 21 March, the summer solstice on or about 21 June, the autumn equinox on or about 23 September and the winter solstice on or about 21 December. In view of the high accuracy of the Gregorian year length, these dates can be considered as attached to the cardinal points. Christmas and New Year's Day both commemorate the winter solstice, just as Easter commemorates the spring equinox. The Hejira calendar does away with the tropical year and defines a (lunar) year as a period of 12 lunar months, each month beginning with the observation of the crescent moon in the evening sky.

The Siddhāntic calendar achieves a very high level of complexity by retaining both the sun and the moon as timekeepers. It is a twin-track calendar. It follows the apparent motion of the sun through the 12 rāśis (zodiacal signs). The ingress of the sun into a rāśi is called a saṃkrānti, which unfortunately is a matter of calculation and not of observation. The Siddhāntic calendar defines a lunation, or a month in the literal sense, as the period say from one new moon to the next. A lunation on an average contains 29.5 days. A solar year cannot contain an integer number of lunations. A Siddhāntic year must therefore contain either 12 or 13 lunations, that is 354 or 383 days. The calenderic scheme is such that in a 19-year span there are 12 years of 12 lunations and seven years of 13 lunations.

The Siddhāntic year begins with the new moon just preceding the Meṣa saṃkrānti, that is the sun's ingress into Aries. The choice of the saṃkrānti is not arbitrary. In about AD 285, this

ingress actually coincided with the spring equinox. Because of the phenomenon of the precession of equinoxes (chapter 3), the spring equinox has now shifted some 23° to the west into the Mīna rāśi (Pisces). Since the sun moves 360° in 365 days, or approximately one degree a day, the spring equinox now takes place some 23 days before the Meṣa saṃkrānti. Similarly, the winter solstice precedes the Makara saṃkrānti (ingress into Capricorn) by as many days.[5]

The Siddhāntic calendar, being unaware of the precession of the equinoxes, identifies the Meṣa saṃkrānti with the spring equinox, and accordingly treats the first month Caitra as marking the beginning of the spring season. Similarly Āśvina, which comes six months later, is taken to mark autumn. Each of these equinoctial new moons marks the beginning of a nine-tithi celebration called navarātrī. (A tithi is the 30th part of a lunation.) These navarātrīs are occasions for religious feasts, rituals and celebrations. During the spring celebrations, mother goddess Gaurī is worshipped on the third tithi, which is also the anniversary of Viṣṇu's first avatāra (incarnation), matsya (fish). Lakṣmi, the goddess of prosperity, is worshipped on the fifth tithi. Finally, the important celebration of Rāma's birthday falls on the ninth tithi, which is also the anniversary of Viṣṇu's third incarnation, Varāha. (Many of the minor celebrations vary from region to region.)

Before embarking upon the autumn equinoctial celebrations, śrāddha ceremony is held as a homage to the dead ancestors. The celebrations themselves begin with Gaurīvratam on the first tithi. Mother goddess Lalitā is worshipped on the fifth, and the goddess of learning, Sarasvatī, on the seventh tithi. Then come the three most important festivals. Durgā, the mother goddess of Śakti, is worshipped on the eighth tithi, whereas the ninth tithi is celebrated as Āyudhapūjā, when the tools of trade are worshipped. There are indications that in Bengal, Durgāpūjā was earlier a part of the spring equinoctial celebrations but later became an autumn celebration. In fact, a special puja is performed on the seventh tithi as an apology for the change. The tenth tithi is somberly dedicated to the immersion of Durgā's idols. Elsewhere, it is celebrated as Vijayadaśamī to mark Rāma's victory over Rāvaṇa. Thus the key equinoctial festival varies from region to

region: Durgāpūjā in Bengal, Āyudhapūjā in south India and Vijayadaśamī mainly in north India.[6]

It is clear from the Rāmāyaṇa itself that Rāma's victory over Rāvaṇa could not have taken place in the Vijayadaśamī month of Āśvina (corresponding to September-October). According to the Kiṣkindhākāṇḍa, Rāma arrived at the capital Pampā in spring, that is Caitra or Vaiśākha. The coronation of Sugrīva took place in Śravaṇa, the first month of the monsoons. Āśvina saw Sugrīva immersed in pleasures from which he was shaken the next month, Kārtika. It was in Kārtika that search parties were sent out, the most important of which, the south party, took more than a month to return and confirm Sītā's presence in Laṅkā. Rāma could have marched against Rāvaṇa only after this. Taking this description at face value, the assault on Laṅkā would have taken place in winter rather than autumn.[7]

Interestingly, the Siddhāntic calendar marks the anniversary of all the ten avatāras of Viṣṇu. The earlier ones (matsya, "fish"; kurmi, "tortoise"; varāha, "boar"; narasiṃha, "man-lion"; and vāmana, "dwarf") are clearly mythical and their anniversaries can only be nominal. The later avatāras Parśurāma, Rāma, Balarāma and Kṛṣṇa are, very likely, historical figures, but they certainly preceded the period of the Siddhāntic calendar by very many centuries. It is therefore well-nigh impossible that the dates associated with their lives could have been known with any accuracy; all the more so when it is likely that the concept of incarnation itself was developed in later times. Interestingly, a day has already been earmarked in the Siddhāntic calendar to commemorate Kalki, the tenth avatāra who is yet to come.

It would be interesting to know the basis of the choice of the anniversary dates for the other avatāras. It is however certain that a day each in the spring and autumn equinoctial celebrations was kept for commemorating Rāma's birth and his victory over Rāvaṇa, respectively.

MAHĀBHĀRATA

The geographical setting of the Bhārata battle also needs re-examination. The Mahābhārata sites appear to be post-battle settlements rather than pre-battle. Indraprastha, said to be founded

by the Pāṇḍavas at the time of the battle, belongs to the PGW culture which is dated c. 850–400 BC. It is therefore chronologically consistent with the battle's being placed at c. 900 BC. In the Mahābhārata, Hastināpura and Ahicchatra are described as ancient capitals of the Kurus and Pāñcālas. They should therefore have been older than Indraprastha. But the so-named sites belong to the same time bracket as the latter.

The location of these sites is also curious. We know now that the thickly forested Ganga Plain was out of bounds for the Copper Age Aryans. They must therefore have lived in the region west of the Yamuna. Hastinapur (near Meerut) is located at the edge of the then civilization. It could only have been reached by crossing the thick Khāṇḍava jungle and the Yamuna. Ahichchhatra is still further to the east. A capital is expected to be located in the middle of the territory. As it is, none of these sites gives the impression of being the ruins of a capital.

It is thus certain that the Hastināpura of the Mahābhārata must have been somewhere to the west of the Yamuna; it is very likely that it was near the Indus. The Kurus are certainly familiar with the northwest. Kuru's own father Saṃvaraṇa, on being driven out by Sudās, took refuge near Sindhu for many years (chapter 7). Dhṛtarāṣṭra married a Gāndhāra princess. The Gāndhāras figure in Ṛgveda (1.126.7) as keepers of sheep. They have been placed on the south bank of the Kabul, in the neighbourhood of the Indus. (The tribe was known to the Iranians; its name survives in the Afghan town of Kandahar.) Pāṇḍu married a princess of the Madra clan who at least in Buddha's time were located in Punjab between the Chenab and the Ravi. The Uttarakurus and Uttaramadras are recognized as real people and located beyond the (mountain) Himavant[8] which, like Mūjavant, is likely to be in the Hindu Kush Range. By implication, the Kurus and Madras are related to them.

The post-battle Kuru king Parīkṣit's son Janamejaya is said to have listened to Vaiśampāyana's recitation of the Mahābhārata in the Naimiṣa forest, which tradition places on the banks of the Gomatī (Gomal). The dynasty's connection with this territory continued right into historical times. Pāṇini mentions Hastināyana near the confluence of the rivers Swat and Kabul. There are Greek references to a people called Astakenoi ('Hasti'?) settled in

the Puṣkaravatī region. Finally, the presence of King Porus (Paurava) in the region between the Jhelum and the Ravi during Alexander's time is well known.

It is therefore reasonably certain that at the time of the Bhārata battle, the Kurus and their capital Hastināpura were located near River Indus. It is surmised that (Meerut) Hastinapur was settled much later. The earliest occupancy layer at (Meerut) Hastinapur belongs to the Copper Age and is characterized by Ochre Coloured Pottery. It is attributed to the non-Aryans. This layer is followed by the PGW culture, heralding the arrival of the Aryans. This settlement seems to have come to an end owing to a flood. Interestingly, the Purāṇas do say that Hastināpura was carried away by river Gaṅgā and the capital shifted to Kauśāmbī. It has been suggested that the archaeologically inferred flood is the same as the one mentioned in the Purāṇas.[9] There is no basis for such a supposition, because floods are a recurrent feature of north Indian rivers. In this particular case, the dates do not match. According to the Purāṇas, flooding took place when Adhisīmakṛṣṇa's son Nicakṣu was ruling over Hastināpura, barely six generations or 100 years after the Mahābhārata war, that is in about 800 BC. At this time, (Meerut) Hastinapur had not even come into existence, leave aside abandoned. It thus appears certain that it was never the capital of the Kurus and was probably founded later by a branch of the clan.

The present-day Kurukshetra is unlikely to have been the battleground. It would have been too far away from the Kuru capital Hastināpura which we have suggested was on or near the Indus. The other participants in the battle too would have occupied small territories near by. The name Kurukṣetra (the land of the Kurus) itself suggests that it was applied to territory around the capital rather than to far-away wilderness. It is reasonable to suppose that the battleground was located somewhere near the Indus. There are references to traffic between the battleground and the capital, during the battle. The two must have been close to each other. This is the region which hosted the Swat VI culture at the time assigned to the Bhārata battle. We may, therefore, tentatively associate the participants in the Bhārata battle with the Swat culture.

At this stage, it may be appropriate to take note of the reports on excavations in Dwarka and Bet Dwarka. Dwarka is situated

on the northwestern tip of the Saurashtra Peninsula, facing the sea. Some 30 km north of Dwarka and barely 2 km off Port Okha lies the island of Bet Dwarka. According to the Mahābhārata and Purāṇas, both these places are associated with Kṛṣṇa. Dwarka (Dvārakā or Dvāravatī) is said to have been founded by Kṛṣṇa right in the sea, not as a new city but on the ruins of an older city, Kusasthali. Bet Dwarka is said to have been Kṛṣṇa's resort.

Off-shore explorations of Bet Dwarka were carried out, during 1983–85, because "ancient texts refer to Dwarka ... as a fortress in water".[10] Five samples were picked from underwater and sent to the Physical Research Laboratory, Ahmedabad, for thermoluminescence dating. Four of the samples were clustered around c. AD 180, while the fifth one was assigned the date 1540 BC.[11]

In these explorations, underwater excavations were carried out for the first time, which, though challenging, suffer from the handicap of not being easily verifiable like the land-surface excavations. While the introduction of marine archaeology is a welcome development, the methodology used in the interpretation of evidence leaves much to be desired. Ignoring the possibility of the sea transporting samples from one place to another, accepting the laboratory results on one sample and rejecting the others, assigning the chosen sample to a particular occupation layer at Bet Dwarka, transferring the chronology from Bet Dwarka to Dwarka, and finally citing this as hard-core evidence in support of selected Mahābhārata and Purāṇic legends is a sequence that is sadly lacking in scientific rigour.

According to Tripathi, "There is no concrete evidence to identify Dwarka with the ancient Dvārakā or Dvāravatī of the Mahābhārata or to date this site to the mid-second millennium BC."[12] In any case, the date 1540 BC suggested for Dwarka is 100 years older than 1400 BC, the date sometimes quoted for the Bhārata battle. In its turn, the date 1400 BC precedes by six centuries the archaeological date assigned to Indraprastha, said to be founded at about the same time as Dvārakā during the time of the Bhārata battle.

It is difficult to look for archaeological evidence for the Bhārata battle itself. "Mahā" in Mahābhārata refers to the embellishment of the accounts of the battle rather than to the battle itself. In view of the low level of technology available at the time

and the fact that as many as five generations from Bhīṣma to Abhimanyu could physically participate in it, it is likely that the war was merely a skirmish and not an "earth-shaking" event, as it was later made out to be.

While the historical tradition contained in the epics and the Purāṇas can be taken to be genuine, its geographical, cultural and material milieu does not appear to be so. Early Aryan kings were small nomadic tribal chieftains whose capital city probably accounted for all the territory they held. The tribes were constantly on the move. Along with the tribe went the place and river names, just as migrating Europeans took along old names to the new world.

Though the Aryans had entered India in the Copper Age itself, they remained confined to the region west of the Yamuna-Ganga doab. It is only when they were fully armed with the iron technology and probably needed more land for an expanding population that they entered the Ganga Plain, cleared the thick forests and took to large-scale farming, trade and manufacturing. They became wealthy and founded cities and empires. It is the culture and the geographical extent of the later-day Aryans that have been backdated and even applied to the early Aryans. Consequently, as the epics and the Purāṇas stand now, they tell us more about the culture and geography of the narrators than the narrated.

11

CONCLUDING REMARKS

A first-rate theory predicts; a second-rate theory forbids; and a third-rate theory explains after the event.

—Aleksander Isaakovich Kitaigordskii

The Ṛgveda is a literary document of the metal age, here assigned the time bracket c. 1700–900 BC. It was the handiwork of a people who did not have a tradition of writing. Consequently, a direct comparison of its contents with archaeological evidence is not possible. While discussing the question of the geographical location and chronology of the Ṛgvedic people, our aim is to narrow down the number of permissible theories by seeking to make them consistent with data from a wide variety of fields including linguistics and literature, natural history, archaeology, history of technology, geomorphology and astronomy.

On the linguistic front, the important facts are as follows: *(i)* The modern languages spoken in the Indian subcontinent fall into two groups: Dravidian and Sanskrit. *(ii)* There are extremely close ties of language, culture, mythology and rituals between the Ṛgvedic and Avestan Aryans. *(iii)* Neither the Avesta itself nor its later commentaries make any statement that would suggest a connection with the Indian subcontinent. *(iv)* There is a close affinity between Sanskrit and many European languages, and this affinity extends to ancient rituals and mythology as well. *(v)* The Finno-Ugric languages contain a number of Indo-European, and more particularly Indo-Iranian, loanwords. The Indo-Europeans must therefore have lived in the physical neighbourhood of the Finno-Ugric speakers.

Natural history imposes the following two constraints: *(vi)* The Aryans, more accurately the proto-Indo-Europeans, domesticated the horse. *(vii)* The Ṛgvedic and Avestan Aryans, but not the other Indo-Europeans, built a cult around the Soma plant,

which has been identified with the alkaloid-yielding varieties of Ephedra. Therefore, the proto-Indo-European habitat must coincide with the natural habitat of the horse, and the joint Indo-Iranian habitat with the natural habitat of the alkaloidal Ephedra. In any case, the Indo-Iranian habitat should be homogeneous enough to permit the use of the same plant as Soma/Haoma. In other words, the Indo-European homeland must be the horse-land; the Indo-Iranian habitat the soma-land.

The compelling archaeological facts are as follows: *(viii)* The Ṛgvedic divinities Mitra, Varuṇa, Indra and Nāsatyas (Aśvins) were known in 1400 BC. This information comes not from India or Iran but from west Asia. *(ix)* The Greater Indus Valley civilization shows a cultural continuity that extended from c. 7000 to c. 2000 BC, comprising the Baluchistan tradition and the early and mature Harappan phases. In the subsequent period, two intrusive elements appeared: the first in c. 2000 BC leading to the formation of the late Harappan phase, and the second leading to a new culture in c. 850 BC called the PGW culture. *(x)* Throughout the archaeological history of India, there is a time progression from west to east: the western sites are always older than the eastern sites. Thus the Indus sites are older than the Ghaggar sites. Later, the Mahābhārata-named (PGW) sites are older (and more westerly) than the Rāmāyaṇa-named (NBPW) sites.

While no single piece of evidence by itself can provide the clinching argument, an examination of the evidence in totality leads to the conclusion that India is not the original home of the Ṛgvedic people. The picture that emerges is as follows: The proto-Indo-European speakers emerged as a pre-historical entity in the steppes north of the Black and Caspian Seas with the domestication of the wild horse. By the time they started dispersing, the Indo-Europeans were already familiar with metal and were not only riding horses but also using wheeled vehicles. The undifferentiated Indo-Iranian-speaking groups moved southwards from the Eurasian steppes in c. 2000 BC and spread over central Asia, Iran and Afghanistan up to River Indus. The merger of the non-Ṛgvedic Indic speakers with the post-urban Harappans led to the establishment of the various late Harappan cultural phases, including the important Cemetery H culture in Punjab.

In c. 1700 BC, another group of Indic speakers settled in south Afghanistan and took to the composition of the Ṛgvedic hymns

in the region between the Helmand and the Arghandab. We have shown that the description of Sarasvatī and Sarayu in the Ṛgveda, and even sūtra literature, fits the Afghan rivers Helmand and Hari-rud better than any river in India. In c. 1400 BC, the Ṛgvedic people moved eastwards to the middle Indus. Eventually, they absorbed the Cemetery H people to found the Painted Grey Ware culture in c. 850 BC in Punjab and on the upper Ghaggar.

The Vedic people remained to the west of the Yamuna-Ganga doab until c. 850 BC. The large-scale settlement of the Ganga Plain took place only when the use of iron became widespread and, perhaps, when population increased. During their migrations, the Indo-Aryans carried with them not only their poetry and religious beliefs, but also place and river names which they selectively reused. (Table 15)

TABLE 15: Chronology proposed in this book

c. 2000 BC	Arrival of (non-Ṛgvedic) Indic speakers in India
after c. 1700 BC to 900 BC	Composition of the Ṛgveda
c. 1450 BC	Rāma's story
c. 1400 BC	Ingress of the Ṛgvedic people into India
c. 900 BC	Bhārata battle
before c. 100 BC	Closure of the Mahābhārata text

This theory can explain in a self-consistent manner geographical references in the various literary texts of the region. It is also consistent with the available linguistic and archaeological data. However, if it is to stand the test of time, it requires a more rigorous and extensive archaeological back-up. In particular, archaeological and chronological data are needed from the region between the Helmand and the Arghandab and from the banks of the Hari-rud. One thing, though, appears certain. If the cultures excavated so far are anything to go by, then no matter what culture is finally associated with the Ṛgveda, its material content is unlikely to prepare one for the intellectual content of the Ṛgveda.

We have given a number of reasons why the old Ghaggar could not have been the Ṛgvedic Sarasvatī. Even if the Ghaggar received the waters of the Satluj and Yamuna in the past, in its upper

course it would still remain a rainwater stream flowing through low hills, unlike the swift, mighty, mountainous river that the Ṛgvedic Sarasvatī is. Many geologists believe that the Yamuna has been flowing in its present channel for at least the last 20,000 years. Also, the Ṛgveda mentions Satluj (Śutudrī) as a member of the Indus river system, implying that the Ghaggar was no longer being fed by the Himalayan snows. A careful hydrological study of the Ghaggar river system and its neighbourhood is needed to accurately determine the various epochs in its eventful history. At what point of time was the Ghaggar transformed from a powerful river—which no doubt it once was—into an ephemeral or barely perennial river? Furthermore, when and how did it reach the pitiable state it is in today? This study would require a joint Indo-Pakistan mission. Both the archaeological work in south Afghanistan and the hydrological study of the Ghaggar can be carried out under the auspices of UNESCO.

On the linguistic front, there is need to use computer techniques to establish the relative chronology of the Ṛgvedic hymns within each maṇḍala. At present, one can only distinguish between the family maṇḍalas and the others, which is of limited help.

We have pointed out that the oft-quoted date of 3102 BC for the Bhārata battle is not mentioned or implied in the Purāṇas but arises from a misappropriation of Āryabhaṭa's astronomical work. We have argued in favour of c. 900 BC as the period of the Bhārata battle and shown it to be consistent with the archaeological and Vedic evidence. Interestingly, if we take the Purāṇic genealogical tables at face value, the earliest Purāṇic chieftains must have lived in the Eurasian steppes.

The bedrock of this work is the archaeological constraint that large-scale settlement of the Ganga Plain took place only in the Iron Age, after c. 900 BC. Since the bulk of the Ṛgveda is by all accounts older than 900 BC, the Ṛgvedic Aryans must have been confined to the region west of the Ganga, no matter where they came from. This means that even if Ṛgvedic Sarasvatī is identified with the old Ghaggar (and we have argued that it should not be), the present-day Sarju cannot be the Ṛgvedic Sarayu. The present-day Gomati, to the west of the Sarju, is already believed to be a later river.

The history of humans is the story of their migrations. This is because we can meaningfullly talk of the original home of our species: "all modern human populations are descended from a single ancestral population that emerged in one place at some time between about 150 Kyr [150,000 years] and 100 Kyr [100,000 years] ago. The fossil evidence, thin as it is, suggests that this place of origin was somewhere in Africa".[1] Surely, the spread was far greater than would have been dictated by the simple material needs of hunters and food gatherers. This suggests that physical compulsions might not have been the only reason behind migrations. A spirit of adventure and desire to see the world might have propelled human groups to move away, leaving behind their co-linguists.

No matter whether migrations were induced by want or restlessness, it seems that generally the older settlers did not feel surprised at the arrival of new migrants, and the two very soon established new equations. If the migrants arrived at a time when the host culture was going strong, they simply joined the mainstream. If, on the other hand, the destination presented a political, economic or cultural vacuum, the newcomers filled this. To take a modern analogy, ancient cultures were not like a reserved railway compartment, where the passengers defend their positions against new arrivals. They were more like an unreserved compartment, where new arrivals, whether welcome or not, are expected and accommodated.

In the Indian context, two migratory waves are particularly important. In about 7000 BC, the proto-farmers seem to have spread from west Asia to usher in the agricultural revolution at various centres including Mehrgarh. It is hard to believe that nobody came into India for the next 5,000 years. It is more likely that the migrants during this period were quietly absorbed. The migrations after c. 2000 BC belong to a different category. The first wave of non-Ṛgvedic Indic speakers modified the existing cultures, while the second wave, comprising the Ṛgvedic people, established its cultural supremacy.

In principle, important clues on the migratory history of the Indo-Iranian speakers and others can be obtained by carefully monitoring genetic differences among well-defined endogamous groups. Whether such an exercise would be deemed politically correct or not is a separate matter.

According to the picture presented here, the Ṛgvedic people are distinct from the founders of the Harappan tradition. There have been some attempts to show that the two were in fact one and the same people. If this assertion is to be considered as established, it must be shown that the mature Harappan phase is entirely consistent with the Ṛgvedic descriptions. This has not been done so far.

We have argued that the composition of the Ṛgveda was taken up in south Afghanistan a few centuries after the demise of the mature Harappan phase. The later parts of the Ṛgveda as well as the later Vedic texts were however composed in India. Under the circumstances, some correspondence between the later Vedic texts and the late Harappan cultural phases is to be expected. There is however no shred of evidence to show that the Mehrgarhians, early-phase Harappans, and mature-phase Harappans had any cultural trait in common with the Ṛgvedic and Avestan people.

Most of the influential work on the interpretation of the Vedic and Avestan texts was carried out at a time when hard-core scientific data were not available to constrain or confront the literary hypotheses. Now that such data are available and are being regularly augmented, one must re-examine what so far has generally been taken as received wisdom on the subject. Academic explanations should be continually reappraised. In scientific interpretation, there is no last word.

NOTES

To help place an author's work in context, the year of the original publication is given. Enclosure of page number(s) in square brackets signifies reference to a reprint/translation, the publication year for which is given in the list of references. In many cases, the reprint is a facsimile of the original edition. When reference is to an entire text, *See* precedes the name.

1: ARROW OF TIME

1. Time is not cyclic, as suggested by planetary motions and traditionally believed. Rather, it is unidirectional. This conclusion follows from the second law of thermodynamics, one of the most important physical laws of nature. See Hawking (1988) for a recent popular account.
2. See Carr (1962) and Kosambi (1975: 1–16) for a "philosophy" of history.

2: THE PROBLEM

1. Amaladass (1992: 212).
2. Mukherjee (1987: 149).
3. F. Max Müller cited in Amaladass (1992: 212).
4. W. Caland cited in Amaladass (1992: 213).
5. Macdonell (1900: [1]).
6. Amaladass (1992: 213).
7. Amaladass (1992: 220).
8. Amaladass (1992: 214).
9. Amaladass (1992: 219).
10. Amaladass (1992: 220).
11. Amaladass (1992: 218).

12. *Sacred Books of the East* [hereafter *SBE*] (1887, 4: [xiv]). In 1777, an era when Anglo-French rivalry extended to all fields, William Jones at Oxford severely condemned Du Perron's Avesta as a later-day work, unconnected with Zoroaster (*SBE* 1887, 4: [xvi]). It is however to Jones's credit that he was the first one to notice the closeness of the Avestan and Sanskrit vocabularies (*SBE* 1887, 4: [xx]).
13. *SBE* (1900, 1: [lvii–lix]).
14. Winternitz (1909, 1: [9]).
15. Mukherjee (1987: 73).
16. Jain (1993: 585).
17. Rocher (1983: 71 n. 78).
18. A glimpse into Jones's Oxford days is provided by the memoirs of Mirza Itesamuddin of Nadia who visited Britain during 1765–6 on behalf of Emperor Shah Alam, thus becoming the first educated Indian in Europe. He met Jones in Oxford:

    > Whilst here I visited Mr Jones; this gentleman is now in the Court of Calcutta. Captain S. [Swinton] and Mr. Jones taking me along with them went to the libraries, where also I saw numerous books in Persian and Arabic. … At that time there was nobody in England who could read Persian (fluently); for this reason the purport and meaning of these papers were not properly understood, and in every place there was the mark of doubt. They showed them to me … and according to my capacity I explained their meaning and sense.
    >
    > Formerly, on ship board, Captain S. read with me the whole of *Kuleelah* and *Dumnah,* and had translated the twelve rules of the *Furhung Jehangeree,* which comprise the grammar of the Persian language. Mr. Jones having seen that translation, with the approbation of Captain S., compiled his Grammar, and having printed it, sold it and made a good deal of money by it. This Grammar is a very celebrated one. (Alexander 1827: 64–6)

    Jones's grammar (published in 1770), however, does not seem to refer to Itesamuddin.

19. The Īśa and other Upaniṣads were translated into English and Bengali during 1816–23 by (Rajah) Rammohun Roy (1772–1833), using Śaṅkara's commentaries on them as his source material and the work of European Sanskritists as an aid. See Nag and Burman (1995: pt. 2).
20. See Colebrook (1805). "European study of the Vedas was made possible by the purchase of a copy at Jaipur by Colonel Antoine Polier, who deposited it in the British Museum in 1789 after letting Jones see it in India" (Marshall 1970: 20).
21. Mitra (1885: [47]).
22. Winternitz (1909, [1: 13]).
23. Monier-Williams (1899: [ix]).
24. The term Indo-European was coined in 1813 by the English polymath Thomas Young (1773–1829). A physician by profession, Young was also an eminent physicist, Egyptologist and a classics scholar. In 1807 he introduced the term energy in the scientific sense. See Wood (1954).
25. Sharp (1920: 10).
26. "Following Said (1978), we may define orientialism as an ideological and operational paradigm consciously created by the west to define and describe the east in such a manner as to facilitate and justify control by the west" (Kochhar 1997: 4).
27. Hoernle (1885: [139]).
28. Max Müller (1884: 13).
29. Sen (1901, 1: 325).
    Interestingly, Mahatma Gandhi (1869–1948) in his formative years was the product of the same historiography. While in South Africa, he addressed an open letter (1894) to the members of the legislature protesting against the ill-treatment of the Indians, and circulated it among the Europeans in Natal. In it, Gandhi pointed out "that both the English and the Indians spring from a common stock, called the Indo-aryan". He then went on to describe, quoting verbatim from European scholars and administrators, the accomplishments "of the Brahmins" in various fields (Gandhi 1979, 1: 176).
30. See Thapar (1996) for an incisive analysis of the political use of the concept of Aryan race.
31. Winternitz (1909, [1: 272–3]).

32. Max Müller (1901: 91).
33. Macdonell (1900: [9]).
34. Macdonell (1900: [127]).
35. Boyce (1979: 92–3).
36. Burrow (1973b: 139).
37. Macdonell and Keith (1912, [2: 434]).
38. Leopold (1974: 578 n. 3).
39. The discovery was made by the German professor Hugh Winckler.
40. Erdosy (1995), recently reprinted in India, provides a valuable multi-authored critique of the various aspects of the problem.

3: LITERARY SOURCES OF ANCIENT HISTORY

1. A large body of primary and secondary literature is available in English on the Vedic corpus. Many volumes of the series *Sacred Books of the East* [*SBE*], edited by F. Max Müller, are devoted to ancient Indian texts. Griffith (1896) provides a handy if not always the best English translation of the Ṛgveda. Though pre-archaeological and biased against the Purāṇas, Macdonell and Keith (1912) provides valuable references to the primary texts.

   Much useful information is contained in the histories of Sanskrit literature; see, for example, Macdonell (1900) and Winternitz (1909). Kane (1973–93) is an invaluable aid. A good secondary source on the Kalpasūtras is Ramgopal (1959). Majumdar (1988: 553–6) provides a general bibliography.
2. Macdonell (1900: [41]).
3. Macdonell (1900: [42]).
4. We use the term Bhārata battle to refer to the actual event—which we assume to be historical—and reserve the term Mahābhārata for the extant text.
5. Deshpande (1978: 297).
6. Saha and Lahiri (1955: [204]).
7. Dikshit (1896, [1: 129]).
8. Dikshit (1896, [1: 86–7]).
9. Mahābhārata (1933–59) The critical edition. 19 vols. Pune: Bhandarkar Oriental Research Institute.

10. Karve (1991: [ix]).
11. Karve (1991: [4]).
12. Macdonell (1900: [239]).
13. Agrawala (1953: 340).
14. Saha and Lahiri (1955: [258]).
15. Fleet (1888: [139]).
16. Macdonell (1900: [255]).
17. See Vālmīki Rāmāyaṇa (1960–75) The critical edition. 7 vols. Baroda: Oriental Institute.
18. Macdonell (1900: [257]).
19. This important discovery is due to Vishnu S. Sukthankar. See, e.g., Kosambi (1975: 142 n. 8).
20. A critical study of the Purāṇas was begun by F. E. Pargiter. Pargiter (1913) is a well-respected work on post-Bhārata-battle royal dynasties. Pargiter (1922) gives valuable references to the pre-Bhārata-battle genealogies, but the work is marred by a blind faith in the Purāṇic accounts.
21. Rapson (1922: 264).
22. Apte (1890: [217, 254, 436]).
23. O'Flaherty (1985: 53–4).
24. Boyce (1979: 58).
25. Boyce (1979: 81).
26. Boyce (1979: 143).
27. Boyce (1979: 125).
28. Boyce (1979: 94).
29. Boyce (1979: 18).
30. Burrow (1973a: 4).
31. Boyce (1979: 18–9).
32. Boyce (1975: 53–4).
33. Macdonell (1900: [51]).
34. Burrow (1973a: 7–8).

4: PURĀṆIC HISTORY

1. The Purāṇic statements in this chapter are taken from Pargiter (1922).
2. There are a number of versions of the story, in all of which Ilā alternates between manhood and womanhood. Thapar

(1966: [28]) is certainly wrong in making Ilā the founder of Sūryavaṃśa in addition to the Candravaṃśa.

3. Brockington (1984: 226).
4. Macdonell and Keith (1912, [2: 97–8]).
5. Ramgopal (1959: 212).
6. Kane (1974, 2: 599–601).
7. Dikshit (1896, [1: 102–4]).
8. Pargiter (1922: [313]).
9. Shukla (1976: 6–8).
10. Shukla (1976: 9).
11. Shukla (1976: 10).
12. Pargiter (1913: [x]).
13. Pargiter (1913: [58, 74]).
14. Raychaudhuri (1923: 117–9).
15. Kosambi (1975: 117).
16. Pargiter (1922: [179]).
17. Pargiter (1922: [180]).
18. Pargiter (1922: [182]).
19. See Sathe et al. (1985).
20. Sen and Bag (1983: 11).
21. Oppolzer (1887: plates 13 and 17).
22. Contrary to popular belief, northwest India's acquaintance with the Greeks began not with Alexander but 200 years earlier when Greek settlements came up in the eastern parts of the Achaemenid empire. The Sanskrit word Yavana is the same as the Persian Yona and corresponds to the Greek Ionian, whereas Alexander was a Macedonian. The term Yavana was known to Pāṇini who preceded Alexander by more than a century. See Narain (1957: 1–2).
23. Kane (1974, 5: 598).
24. Kane (1974, 5: 680).
25. Pusalkar (1988: 320 n. 4).

5: ARCHAEOLOGICAL SETTING

1. Possehl (1992a: 133).
2. This section is based on Jarrige and Meadow (1980).
3. Unless otherwise stated, all archaeological dates quoted in this book are mean calibrated radiocarbon dates, based on a half-life of 5,730 years, taken from Possehl (1994).

4. Mughal (1992a: 125).
5. Shaffer (1992, 1: 444).
6. Mughal (1992a: 128).
7. Shaffer (1992, 1: 444–7).
8. Cunningham (1875: [105–8]).
9. Cunningham (1875: [107]).
10. Cunningham (1875: [108]).
11. Wheeler (1947: 60).
12. Jansen (1985: 164).
13. Jansen (1985: 163).
14. Jansen (1985: 164).
15. Misra (1992: 4).
16. Allchin and Allchin (1982: 187).
17. See N. Kochhar (1985).
18. Agrawal (1982: 146).
19. Possehl (1992a: 134).
20. Allchin and Allchin (1982: 219).
21. Allchin and Allchin (1982: 157).
22. Allchin and Allchin (1982: 151).
23. Mahadevan (1977: 7).
24. Bisht (1989–90: 81).
25. Rao (1982: 5).
26. Allchin and Allchin (1982: 187).
27. Mahadevan (1977: 7 table 6.2).
28. Zvelebil (1990: 85).
29. Mahadevan (1977: 9).
30. Mahadevan (1977: 12–3).
31. Shaffer (1992, 1: 450–1).
32. Ghosh (1989, 2: 94).
33. Dani and Thapar (1992: 304).
34. V. Gordon Childe, quoted in Wheeler (1947: 81).
35. Wheeler (1947: 82).
36. Wheeler (1947: 83).
37. Wheeler (1947: 82).
38. Kosambi (1975: 74).
39. Parpola (1988: 208 n. 132).
40. Parpola (1988: 211).
41. Parpola (1988: 219).
42. Hillebrandt (1927, [1: 340]).

43. See Rau (1976).
44. Rau (1976: 52).
45. Wheeler (1966: 79–82).
46. Since the Harappan fortifications could not have been directed against the arrival of the Indic speakers, which was in the future, the fortifications must have been aimed at people who lived in the neighbourhood but were outside the Harappan culture area.
47. Ghosh (1989, 1: 91–4).
48. Possehl and Rissman (1992, 1: 482).
49. Agrawal (1982: 214).
50. See Misra (1997).
51. Possehl and Rissman (1992, 1: 482).
52. Ghosh (1989, 1: 94).
53. Possehl (1994: 11–2).
54. Ghosh (1989, 1: 107).
55. The names of archaeological sites are given their present-day spellings, while the names of inhabitations mentioned in the texts are spelt phonetically. Thus the archaeological sites of Hastinapur and Ahichchhatra correspond to the ancient Hastināpura and Ahicchatra.
56. Lal (1954–5: 7).
57. Ghosh (1989, 2: 353).
58. Joshi (1993: 1).
59. Joshi (1993: 8).
60. Joshi (1993: 25).
61. Ghosh (1989, 1: 241).
62. Ghosh (1989, 1: 108).
63. Ghosh (1989, 1: 251).
64. See Lal and Dikshit (1978–9).
65. Agrawal et al. (1981: 171) gives a thermoluminescence date of c. 750 BC for the "pre-NBPW" layer.
66. Lal and Dikshit (1978–9: 7).
67. Ghosh (1989, 2: 251).

6: INDO-IRANIAN HABITAT

1. Even though the excavation at Hastinapur has been vertical rather than horizontal, walls of wattle and daub, mud, and mudbricks suggest modest structures (Ghosh 1989, 2: 164).

2. *Indian Archaeology: A Review 1983–4*, 28.
3. Joshi (1993: 20, 39).
4. Ramgopal (1959: 554, 559).
5. Agrawal (1982: 198).
6. Macdonell and Keith (1912, [1: 238]).
7. Thapar (1978: 52 n. 30) makes Sītā's father Siradhvaja Janaka later than the celebrated Videha king Janaka who belongs to the post-Bhārata battle period. Lal and Dikshit (1978–9: 7) conclude that "This [archaeological evidence] would place the [Rāmāyaṇa] story early in the seventh century B.C." The news of excavation at Ayodhya was published in *The Times of India* (6 January 1981) under the caption "Rāmāyaṇa period around 800–700 BC".
8. Pargiter (1913: [67]).
9. See Kochhar (1990, 1991).
10. Following Hoernle (1880), it has been widely believed that the Indic speakers came to India from the northwest in two waves. The first wave comprised the non-Ṛgvedic people who moved furthest to the east, permitting the Ṛgvedic people who came later to settle near the Yamuna (see, e.g., Deshpande 1995). The hypothesis is untenable. The natural thing for the first comers would have been to occupy the first inhabitable area they came across, rather than leave it for the second wave. More concretely, we now have firm archaeological evidence that large-scale settlement of the plain east of the Ganga did not take place well into the Iron Age.
11. Ghosh (1988: 339).
12. *SBE* (1887, [4: 2]).
13. Boyce (1979: 93).
14. Singh (1995: 263).
15. *SBE* (1887, [4: 3]).
16. Hillebrandt (1927, [1: 129–51]) provides a summary of the characteristics of the Soma plant as culled from the Ṛgveda and Avesta.
17. *SBE* (1887, [31: 230–47]).
18. Falk (1989: 79).
19. Modi (1937: [283]).
20. Hillebrandt (1927, [1: 145]).
21. Hillebrandt (1927, [1: 175]).

22. Hillebrandt (1927, [1: 154–6]).
23. Modi (1937: [285]).
24. Modi (1937: [282]).
25. Hillebrandt (1927, [1: 156]).
26. Hillebrandt (1927, [1: 158]).
27. O' Flaherty (1968: 96).
28. Hillebrandt (1927, [1: 136]).
29. Hillebrandt (1927, [1: 159]).
30. O'Flaherty (1968: 96–7).
31. O'Flaherty (1968: 98).
32. O'Flaherty (1968: 99).
33. O'Flaherty (1968: 102).
34. O'Flaherty (1968: 103).
35. Watt (1890: 249).
36. O'Flaherty (1968: 106).
37. O'Flaherty (1968: 106–7).
38. The verse occurs in Dhūrtasvāmi's commentary on Āpastamba Śrautasūtra (O'Flaherty 1968: 100).
39. O'Flaherty (1968: 108).
40. O'Flaherty (1968: 110).
41. O'Flaherty (1968: 109).
42. O'Flaherty (1968: 110).
43. O'Flaherty (1968: 118).
44. Watt (1890: 248).
45. Modi (1937: [285]).
46. Modi (1937: [286]).
47. O'Flaherty (1968: 122).
48. Macdonell and Keith (1912, [2: 475]).
49. Stein (1931: 503).
50. Geldner (1951, 3: 2).
51. The idea that Soma was a mushroom popularly known as fly-agaric or toadstool originated with R. G. Wasson in 1968 (Bender 1971), and was accepted by Needham (1974: 116). Wasson speculated: "Did the priests initially have recourse to porters who travelled to the far north, to the forest belt of Eurasia, to assure their supplies of the divine plant? Two such porters could have carried loads of dried fly-agaric to last perhaps a whole year" (Bender 1971: 14). This runs counter to the Ṛgvedic description of Soma being plucked

from the wayside. "If Soma was the fly-agaric, why was it abandoned?" Wasson asked, and proceeded to answer rather haughtily: "If the Rigveda speaks in unmistakable terms about the fly-agaric as Soma . . . that settles the problem. I am concerned with the Vedic times. It is not incumbent on me to face the problem of post-Vedic history" (Bender 1971: 13). See Nyberg (1995) for a review of the pharmacological properties of the various candidate plants.

52. Falk (1989: 87).
53. Sastri (1952: 177–8).
54. Watt (1890: 251–2).
55. Saha and Lahiri (1955: [225]).
56. Pingree (1978: 536).
57. Burrow (1973a: 28–9).
58. Burrow (1973a: 27).
59. Thieme (1960: 301–17).

7: ṚGVEDIC RIVERS

1. Macdonell and Keith (1912) is a convenient source of information.
2. Burrow (1973b: 126) believes that the Ṛgvedic Sarayu was some river in northwest India, named after Haroyu of an earlier period.
3. Dupree (1980: 36).
4. Sharma (1993: 3) is wrong in deriving Aria from Ārya.
5. Curiously this important passage is merely referenced in Macdonell and Keith (1912, [1: 330]) under Triplaksa but not discussed. Allchin and Allchin (1982: 308) misquote it, replacing the geographically significant "descend into Yamuna" with the inconsequential "proceed towards right".
6. Bharadwaj (1986: 77).
7. Wilhelmy (1969: 79–80).
8. Pal et al. (1980: 321–2).
9. Macdonell and Keith (1912, [2: 435]).
10. In this legend, the earlier name of the river is not given as the Ṛgvedic Śutudrī, but merely as descriptive Haimavati ("flowing from the mountains"). In the preceding passage (Adiparvan 167.5), even the Ṛgvedic name Vipāś is attributed to Vasiṣṭha. See Roy (n.d., 1: 407).

11. Hillebrandt (1927, [1: 346]) identifies the Ṛgvedic Sarasvatī of maṇḍala 6 with the Arghandab. However, he considers (: 352) the Sarasvatī of the third and seventh maṇḍalas to be "the small river in the Madhyadesa which was considered sacred in later periods", even though the Sarasvatī of Ṛv (7.95–96) is as mighty as the river of the sixth maṇḍala. Burrow (1973b: 126) and Kosambi (1975: 89) both consider Harahvaiti to be the original pre-Ṛgvedic river. While Kosambi identifies it with the Helmand, Burrow does not commit himself.
12. Dupree (1980: 37–8).
13. Stein (1886: 22).
14. Pargiter (1922: [260]).
15. Hillebrandt (1927, [1: 241]).
16. Pargiter (1922: [281]).
17. Pargiter (1922: [281]).
18. Bhargava (1964: 71).
19. Bharadwaj (1986: 23).
20. Bharadwaj (1986: 11).
21. Bhargava (1964: 71).
22. Bharadwaj (1986: 40 n. 119).
23. Bharadwaj (1986: 133).
24. Misra (1994: 512–4).
25. Misra (1994: 518–9).
26. See Mughal (1992b).
27. "Of the early and mature Harappan periods, only two sites each are found on the Satluj, both near Ropar where the river emerges from the Siwaliks. Of the late Harappan period, only seven sites are found in this river, all of them in the upper reaches close to the hills. There is a complete absence of sites, once the river enters the plains" (Misra 1994: 514).
28. See Singh et al. (1990).
29. See Courty (1986).
30. Singhvi and Kar (1992: 96–9).
31. See Caratini et al. (1991).
32. See Sukumar et al. (1993).
33. Sarianidi (1987: 46).
34. Pargiter (1913: [147–8]).

35. See Kochhar (1999).
36. See Stein (1886).

8: INDO-EUROPEANS AND INDO-IRANIANS

1. Mallory (1989: [12–3]).
2. Mallory (1989: [126]).
3. Mallory (1989: [39]).
4. Mallory (1989: [115]).
5. Kosambi (1975: 6).
6. Burrow (1973a: 23).
7. Mallory (1989: [149]).
8. Mallory (1989: [111]).
9. Mallory (1989: [119]).
10. Griffith (1896: [21 n. 5]).
11. Burrow (1973a: 73).
12. Macdonell and Keith (1912, [1: 42]).
13. Mallory (1989: [119]).
14. Hegde (1991: 4).
15. Mallory (1989: [198]).
16. Anthony (1986: 296).
17. Anthony (1986: 297).
18. Mallory (1989: [210]).
19. See Parpola (1999).
20. Work on the Okunevo culture has not been translated into English. One may consult Kyzlasov (1986).
21. Mallory (1989: [223–5]).
22. See Parpola (1999).
23. Masson (1992b: 347).
24. Kuzmina (1994: 403).
25. Masson (1992b: 348).
26. This section is based on Masson (1992c), Dupree (1980: 3–14), and the *Enclyopaedia Britannica*.
27. *Enclyopaedia Britannica* (1984, 3: 119) wrongly places Kyzyl Kum in Turkmenistan and Kara Kum in Kazakhstan.
28. Parpola (1988: 203).
29. Masson and Sarianidi (1972: 36).
30. Masson and Sarianidi (1972: 59).
31. Masson and Sarianidi (1972: 113–4).

32. Masson and Sarianidi (1972: 120).
33. Masson and Sarianidi (1972: 122).
34. Masson and Sarianidi (1972: 116). The absence of any cultural discontinuity between Namazga IV and V along with clear signs in Namazga V of inspiration from Mesopotamia strongly argues against the hypothesis (Parpola 1988: 204) ascribing the Namazga V culture to the newly arrived Indo-Iranian-speaking Dāsa tribes.
35. Masson and Sariandi (1972: 124).
36. Voigt and Dyson (1992, 1: 122).
37. Masson and Sarianidi (1972: 124).
38. Shaffer (1992, 1: 461).
39. Voigt and Dyson (1992, 1: 143).
40. Masson and Sariandi (1972: 125).
41. Masson and Sariandi (1972: 140).
42. Shaffer (1992, 1: 464).
43. Sarianidi (1987: 44). The name is changed to MBAC in Sarianidi (1993).
44. Sarianidi (1987: 53).
45. Sariandi (1987: 46).
46. Masson (1992b: 342–4).
47. Masson (1992b: 340).
48. Masson and Sarianidi (1972: 146).
49. Masson and Sarianidi (1972: 141–2).
50. Masson and Sarianidi (1972: 144–5).
51. Sarianidi (1986: 5–6).
52. Possehl (1994: 116).
53. Sarianidi (1987: 49).
54. Possehl (1994: 37).
55. Sarianidi (1994: 388).
56. Shaffer (1978: 183).
57. Possehl (1994: 31).
58. Tosi et al. (1992: 220).
59. Litvinsky and P'yankova (1992: 380).
60. Shaffer (1978: 183).
61. Possehl (1994: 31).
62. Sarianidi (1990: 58).
63. Masson and Sarianidi (1972: 147–9).
64. Masson and Sarianidi (1972: 150).

65. Litvinsky and P'yankova (1992: 382–6).
66. Possehl (1994: 116).
67. Litvinsky and P'yankova (1992: 386–8).
68. Hadingham (1994: 68–74).
69. Monier-Williams (1899: [382]).
70. Agrawala (1953: 67–9).
71. Monier-Williams (1899: [911]).
72. Hillebrandt (1927, 1: [342]).

9: ṚGVEDIC PEOPLE AND OTHER INDIC SPEAKERS

1. Stacul (1987) and Dani (1992). For a concise summary, see Parpola (1988: 241–8).
2. Dani (1992: 397).
3. Dani (1992: 403).
4. Dani (1992: 413).
5. Dani (1992: 407).
6. Dani (1992: 399).
7. Dani (1992: 407).
8. Dani (1992: 401–2).
9. Dani (1992: 415).
10. Parpola (1988: 239).
11. Allchin and Allchin (1982: 233).
12. Santoni (1984: 52).
13. Santoni (1984: 56).
14. Santoni (1984: 58).
15. Santoni (1984: 56).
16. Allchin and Allchin (1982: 233).
17. Allchin and Allchin (1982: 136–7, 233).
18. Allchin and Allchin (1982: 231).
19. Allchin and Allchin (1982: 234).
20. Allchin and Allchin (1982: 242).
21. Shaffer (1992, 1: 461).
22. Agrawal (1982: 214).
23. Falk (1994), however, identifies the anthropomorph of the eastern hoards with the Vedic vajra.
24. Dani (1992: 399).
25. Mughal (1992a: 134).

26. Lal (1979: 65).
27. Rao (1985: 27).
28. Ghosh (1989, 2: 260).
29. Ghosh (1989, 2: 196).
30. Possehl (1994: 55).
31. Dani and Thapar (1992: 315).
32. Possehl (1994: 106).
33. Rau (1974: 141).
34. Sarianidi (1986: 8).
35. Ghosh (1988: 350).
36. Simpson (1951: 17).
37. Rau (1976: 49–50).
38. Rau (1976: 44–7).
39. A recent, meticulously researched book on the "Indian discipline of growing and sharing food in plenty" quotes extensively from a wide spectrum of ancient texts ranging from the Brāhmaṇas to the Purāṇas and the epics. Significantly, there is only one citation from the Ṛgveda (Ṛv 10.117) and that too from the tenth maṇḍala which is known to be a late maṇḍala. The absence of any reference to the older parts of the Ṛgveda is consistent with the hypothesis that by the time of the tenth maṇḍala, the Ṛgvedic people were already residing in the plains where they could grow food in plenty, whereas the older maṇḍalas correspond to the Hindu Kush region without prospects of a food surplus. See Bajaj and Srinivas (1996). This book carries blessings from the various ācāryas.
40. Parpola (1994: [160]).
41. Mallory (1989: [44]).
42. See Renfrew (1988).
43. See Coleman (1988); Mallory (1989).
44. See Cavalli-Sfroza et al. (1993).
45. See also Sharma (1995).
46. Deshpande (1995: 75).
47. See, for example, Ṛv 1.127.6–7, Ṛv 10.61.5–8 (already noted on p. 19) which Griffith self-consciously placed as an appendix, and that too translated in Latin (Griffith 1896: [652–3]).

10: RĀMĀYAṆA AND MAHĀBHĀRATA

1. Agrawal et al. (1981: 171) gives a thermoluminescence date of c. 750 BC for the "pre-NBPW" layer.
2. As before, the Purāṇic information comes from Pargiter (1922).
3. See Stacul (1990).
4. Mankad (1965: xxxvi).
5. Saha and Lahiri (1955: [245–7]).
6. Pillai (c. 1912: xvi–xix).
7. Mankad (1965: xxxi–xxxii).
8. Macdonell and Keith (1912, [1: 84–5]).
9. Ghosh (1989, 2: 166).
10. Rao (1988: 46). Curiously, the underwater exploration of Dwarka and Bet Dwarka does not figure in the otherwise comprehensive Ghosh (1989).
11. Personal communication from Prof. Ashok Kumar Singhvi, head, Thermoluminescence Laboratory, Physical Research Laboratory, Ahmedabad.
12. Tripathi (1996: 49).

11: CONCLUDING REMARKS

1. Tattersall (1997: 53).

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Mohammad Moienuddin

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Irfan Habib

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Mohammad Moienuddin is the chairman of the Tipu Sultan Research Institute and Museum, Bangalore.

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Professor Kochhar was awarded the Jawaharlal Nehru Fellowship in 1995 and was a Fulbright Visiting Lecturer at the Chicago Academy of Sciences, USA, in 1997. He is the chairman of the Scientific Advisory Committee of the Positional Astronomy Centre, Calcutta, and a member of the editorial board of *Journal of Astronomical History and Heritage,* New Zealand. He is the author, along with Professor Jayant Narlikar, of the definitive *Astronomy in India: A Perspective.*

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